DISEASES OF THE SKIN

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FIFTH EDITION

BY

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With 63 Coloured Plates and 230 Text figures



LONDON

J. & A. CHURCHILL LTD

104 GLOUCESTER PLACE

PORTMAN SQUARE

1947

First Edition	1911
Second	1915
Third	1919
Fourth	1927
Spanish Translation	1926
Fifth Edition	1947

Printed in Great Britain

PREFACE TO THE FIFTH EDITION

The long interval which has elapsed since the publication of the Fourth Edition of this work has seen many advances in dermatology and syphilology. It was hoped to bring out the present issue before the war and it is needless to recount the difficulties that catastrophe brought. A number of the blocks were damaged and are somewhat imperfect, others were destroyed by fire, but we were able to replace some of the original photographs by the courtesy of the staff of the London Hospital Medical College. As in previous editions the major part of the illustrations are taken from patients under our own care but we have to tender our grateful thanks to friends at home and abroad for their generous help in permitting us to use photographs or reproductions from their published works. These are acknowledged in the appropriate places.

The co-editors were students, house-physicians and registrars in Dr Sequeira's clinic at the London Hospital and were honoured by the invitation to co-operate in the new edition of this familiar book and have attempted to incorporate their twenty years' experience in that of their esteemed teacher.

The whole work has been revised and many sections have been re-written and large additions have been made. Some alteration in the arrangement and grouping of subjects has been made to bring dermatology into line with general medicine and to facilitate the student's approach to the subject. This also conforms with the present tendency to relate medicine more intimately with social and environmental influences.

Special attention has been given to the important and ever growing subject of industrial dermatoses. Radiotherapy, so far as it concerns treatment of the integument, we still claim as being within our province as dermatologists and as such demands our attention. We hold the opinion that fractional X-ray therapy is useless if not integrated in a broad therapeutic plan.

The prolonged residence of one of us (J. H. S.) in the tropics has enabled us to develop the sections on exotic diseases. As in previous editions considerable space is given to syphilis and we have incorporated the results of a prolonged study of its modern treatment. Chemotherapy as applied in dermatology rightly claims an important place in the new edition.

With a view to keeping the book to a convenient size we have omitted some matter which was of historical or academic interest only and have endeavoured, as in the past, to give our own experience, especially when dealing with treatment. We have removed many of the references in the previous editions and substituted a few which may serve as guides to further study. It appears to us that a voluminous bibliography is unnecessary in a text book, as an advanced student and research worker can obtain references from one of the indices with the assistance of a skilled librarian.

We are grateful to the many colleagues, medical and lay, from whom

we have constantly received help which has been directly or indirectly related to this work. One of us (R. T. B.) wishes to express his esteem and gratitude to Sir Charles J. Martin for much encouragement and help especially in bacteriology, to Professor Arthur Ellis for his guidance and research facilities in biochemistry, and to Professor S. P. Bedson for his expert direction in the study of virus diseases of the skin.

We have constantly turned for guidance in matters pathological to Professor Matthew J. Stewart and to Dr. W. Freudenthal.

To Mr. Norman Graham, solicitor, we are indebted for the contribution on the medico legal aspects of industrial dermatoses.

We have not hesitated to consult the many dermatological text books of our colleagues at home and abroad and we would draw attention to the following works dealing with special aspects of dermatology as being essential to the more complete study of the subject. Industrial dermatoses —Prosser White, Schwartz and Tulipan. Pathology—Kyrle, Lee McCarthy, MacLeod and Muende. Mycology—Lewis and Hopper. Tropical diseases—Manson Bahr. Recent Advances—W. N. Goldsmith. Dermatological Atlases—Jacobi (MacCormac), Semon and Moritz.

We are indebted to the editor and publishers of the British Encyclopaedia of Medical Practice for their permission to include portions of our contributions to that work and to Dr. F. Davis for some notes on and illustrations of purpura.

Our thanks are due to our secretaries, Miss E. M. Earnshaw and Miss V. M. Heseltine, for their untiring help with the manuscript and proofs and to Miss F. M. Wright for the water colours from which the new coloured plates and some copies of damaged ones were made, and to Messrs. J. and A. Churchill and their staff for their courteous help in the preparation of the text and the illustrations.

JAMES H. SEQUEIRA, Kenya.
JOHN T. INGRAM, Leeds.
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PREFACE TO THE FIRST EDITION

This book began with notes for a course of lectures delivered in the Skin Clinic of the London Hospital in 1902 and has gradually grown with the experience of nine years teaching. The work being primarily designed for the student, and in the hope that it may also be of use to the practitioner, I have devoted special attention to diagnosis and treatment, omitting historical references and discussions of debated points. The general arrangement of the chapters is on etiological lines, a system which modern developments have rendered possible though still incomplete. Where such a classification has been impracticable, the diseases are grouped according to their morphological characters. If any apology is needed for such an arrangement, I can only say that I have found it exceedingly useful in teaching.

Great care has been taken in the selection of the illustrations, which, with a few exceptions, are from my own cases. I cannot express adequately my gratitude to Dr Arnold Moritz for the time and trouble he has expended over the photographs, taken direct from patients in three colours. From these the plates have been made. Only those who have had experience in this kind of work can appreciate the enormous difficulties involved. The black and white illustrations are from photographs taken by Mr F. E. Wilson, late clinical photographer at the London Hospital. For the photographs of the animal parasites I am indebted to my former clinical assistant Dr T. J. Williams, and to Dr C. W. Daniels for the illustrations of tropical affections.

For the convenience of students and others desiring to study more in detail particular subjects, I have appended to each section a few references to recent articles, and especially to those in which the literature of the subject is to be found. In a work of this scope no attempt has been made to give complete bibliographies, and I trust that authors whose names are omitted will pardon the absence of direct references to their work.

In conclusion, I have to acknowledge my indebtedness to the writers in *La Pratique Dermatologique* and in Mracek's *Handbuch*, to the text-books of Radcliffe-Crocker, Malcolm Morris and others, to Unna's "Histopathology," and to the many friends who have kindly sent me monographs and reprints. In the tiresome work of reading the proof sheets and for many suggestions I have to acknowledge the great assistance afforded me by my brother, Staff-Surgeon W. S. H. Sequeira, R.N., M.B. It is also a pleasing duty to thank my publishers for their courtesy and generosity, especially in the matter of illustrations.

JAMES H. SEQUEIRA.

MANCHESTER SQUARE, W.

GROUP 6

ATROPHIC AND HYPERTROPHIC DERMATOSES TUMOURS OF THE SKIN

GROUP 7

DISEASES OF THE APPENDAGES OF THE SKIN

LIST OF PLATES

GROUP 6

ATROPHIC AND HYPERTROPHIC DERMATOSES, TUMOURS OF THE SKIN

GROUP 7

DISEASES OF THE APPENDAGES OF THE SKIN

LIST OF PLATES

DISEASES OF THE SKIN

INTRODUCTION

Dermatology and its Place in General and Environmental Medicine—Principles underlying Etiology Diagnosis and Treatment

The diseases of the skin can only be understood properly if they are approached with a sound knowledge of general medicine. In this work it will be our endeavour to show that the health of the skin largely depends upon and reflects the maintenance of a sound body in a healthy environment. Though dermatology is commonly regarded as a speciality the skin does in fact portray every aspect of general medicine in a way that is denied to those organs which are hidden from view.

The skin, which is so extensive and so easy of approach, provides an excellent field for training in observation. In dermatology it is not easy for the physician to deceive the patient or to deceive himself. He must soon learn the infinite variety of patterns which may be assumed by the same disorder in different persons and will often see resemblances where other people see differences. He will also learn how readily interference may aggravate and masterly inactivity heal.

Too often the student approaches the study of diseases of the skin with the idea that it is something alien to general medicine.

We would point out that the study of dermatology affords exceptional opportunities for the observation of elementary disease processes. What is seen on the surface is some guide to what occurs in internal organs and we think an early acquaintance with the simpler phenomena might well be utilised. We would like to see a short course of instruction illustrating cutaneous reactions to local irritation, microbic infection, etc., an integral part of the training of the embryo clinician.

The skin is invaded by most of the organisms and all the processes which attack other organs and its reactions to these serve to elucidate the effects of disease elsewhere. All the major debilitating affections which involve the organism as a whole are reflected in the skin. States of toxæmia and anæmia, nutrition, vitamin deficiency and metabolism as well as nervous and psychological disturbances can all be recognised and often present diagnostic and prognostic criteria.

Probably the most significant behaviour of the skin lies in the psychological field. This is no doubt related to the fact that the central nervous system is developed as an infolding of the ectoderm of the embryo and that in those animals in which no such special development occurs the ectoderm functions as brain. These relationships will be discussed in the chapters on the physiology of the skin and in the numerous dermatoses[1] which have a nervous or psychogenic origin.

A minority of the dermatoses, though paralleled in other organs are peculiar to the skin, and depend upon changes in the epidermis and the

[1] We use the term "dermatosis" to indicate any skin disease.

appendages We shall see that some of them are due to external influences physical chemical or microbic. Parallel reactions occur in the respiratory and gastro-intestinal tracts

Many affections of the skin however are the expression of diseases affecting the body as a whole and are to be interpreted by the criteria which we apply in general medicine

CHAPTER

THE NORMAL SKIN

Histology and Physiology

There are so many variations in the appearance of the normal skin when examined by the naked eye or under a hand lens, that generalisation is impossible. Variations in colour and texture are due to race, to family, to climate and even to season. In the individual different characters are found in different areas, and such are recognisable even in the darkest negro. The age of the subject is an important factor; in the perfectly healthy the smooth supple integument of youth ultimately develops into the withered inelastic dried-up skin of the senile. We shall learn how far these changes depend upon endocrine, nutritional and environmental factors.

Beauty of complexion depends, as we have just indicated, partly upon youth, but heredity plays an important *rôle* and good health usually, though not universally, contributes its share. We are able to recognise that there are what one may call "thin" or delicate skins which react easily to external influences. They are common in blondes, in whom also vascular changes produced by emotion are often embarrassingly evoked. The "thick" or more resistant skins endowed with a highly protective epidermis, though commoner in brunettes, are also met with in some fair individuals. The activity of the cutaneous glands shows many variations. Normally there should be adequate reaction to changes of temperature, but some subjects in perfect health exhibit a tendency to excessive sweating or oily secretion. In the negro the skin in health is shiny and oily and plugs of greasy matter may be seen in the orifices of the sebaceous glands. The experienced observer at once recognises that a dry skin in the black man indicates sickness.

The hygiene of the skin is important and simple cleanliness will prevent many ailments of exogenic origin. By simple cleanliness we mean not only of the person but of the body linen, etc. It cannot be too widely known that *there are few better prophylactics than soap and water.* Special attention will be required for exposed areas, especially by those engaged in certain industries. This subject will be discussed when we come to consider the "occupational" dermatoses. The flexures require particular care in everyone, *e.g.* the retro-auricular sulcus in children, the axillæ, the submammary fold, the umbilicus, the genitocrural and peri-anal areas.

We shall have occasion to observe that the excessive use of soap and water especially with inefficient drying may damage the protective surface layers. While we do not deny that there may be *individuals* with an epidermis which is affected even by a basic super-fatted soap, we cannot support the contention of many mothers seen in private practice that their daughters' complexions can only be preserved by complete abstention from the use of soap for the face and the comparatively large areas exposed in modern evening dress. Some of the best complexions we have seen have been in countrywomen who have washed with household soap all their lives.

Langer's lines The normal lines on the skin have been studied for a long time Probably the best description is to be found in Erasmus Wilson's classical work In 1862 Langer published the results of an extensive study and the lines have received his name Many of these "lines" can be seen easily with the naked eye, others may require a hand lens The most interesting are those which are formed by creases over joints and other movable parts Excellent examples are seen on the palmar surface of the digits The essential feature is that the lines are produced by the special distribution of fibrous and elastic tissue in the corium or true skin and their deep attachment which prevents the integument puckering up in a fold like the finger of a glove

The faint lines seen under a lens which divide the surface into innumerable triangles and other figures are remarkably constant in the individual and on the digits form the basis of the study of finger prints In certain areas notably on the abdomen there are what Wood-Jones called "tension lines" which demand the attention of the surgeon when he is planning incisions for cuts made across such lines of tension tend to gape

Hair trends are dealt with on p 10

HISTOLOGY OF THE NORMAL SKIN

The integument is composed of three layers the epidermis or cuticle the dermis or corium and the subcutaneous tissue or hypoderm

The epidermis (Fig 1) is a non vascular protective covering composed

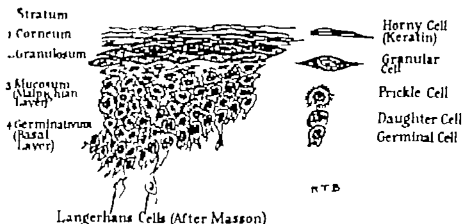


FIG 1 Vertical section of epidermis (diagrammatic).

of stratified pavement epithelial cells It has four layers—(1) the stratum corneum including the stratum lucidum, (2) the stratum granulosum (3) the stratum mucosum (Malpighian layer) (4) the stratum germinativum

(1) The *stratum corneum.* The superficial part of the horny layer *consists of cells* which are constantly shed They do not stain well with osmic acid and owing to their loose attachment are sometimes called the stratum disjunctum The main part of the stratum corneum varies in thickness in different parts of the body It reaches its highest degree of development on the palms and soles and is enormously thickened in

regions exposed to pressure Extreme cases of this hypertrophy of the horny layer are common on the soles of those races which habitually walk barefoot and the thickened plantar integument makes the Babinski reflex somewhat difficult to obtain in the negro. The cells are flattened and lie in lamellæ They have no nuclei and are composed of keratin and in the horny plaques of the workman s hand there is a little eleidine There is also an epidermic fatty material which gives suppleness to the corneous layer The *stratum lucidum* lies immediately under the stratum corneum and may be looked upon as intermediate in its structure between the horny and granular layers. It has a homogeneous appearance, its cells are non-nucleated and devoid of fatty matter but contain flakes and larger droplets of keratohyalin

(2) The *stratum granulosum* consists of one to three or four layers of cells lozenge shaped in section and containing granules of eleidine staining easily with carmine The intercellular fibrils of the mucous layer have shrunken or disappeared

(3 and 4) The *stratum mucosum* consists of several parts. The basal layer or stratum germinativum consists of cylindrical cells in one or two layers, with large nuclei showing karyokinetic figures In this part of the epidermis the pigment is chiefly deposited. Above it lies the prickle-cell layer consisting of several rows of irregular polygonal nucleated cells, united by filamentous processes As the stratum granulosum is approached the cells become flatter and fusiform, and finally stratiform.

The protoplasmic fibrils appear to maintain continuity of the spongioplasm between epidermal cells, even to the basal layer where coarser extensions penetrate the dermis. Many of the basal cells may therefor b described as dendritic although this adjective is often reserved for the melanoblasts which may be basal cells whose function is mainly pigmentary The ability of the other basal cells to form pigment would thus be explained but some believe the melanoblasts are of mesoblastic or of nervous origin and that they alone produce melanin in the skin and pass it to the basal cells

Pigment. Melanin is an iron-free pigment occurring in the cytoplasm adjacent to the nucleus It is most abundant in the basal cell layer of the epidermis, the corresponding cells in the hair papillæ and in certain cells in the dermis.

Melanoblasts and cells of Langerhans. Besides the epidermal cells starting in the germinal layer and gradually undergoing modification as they grow towards the surface there are the important elements known as *melanoblasts* The *melanoblast* has a *nucleated body lying beneath* or between the basal cells. From it arise a number of fine branching filaments which pass up between the palisade cells and form a network about them. In sections of fresh skin the cytoplasm of these cells blackens with Bloch s dopa (see p 12)

One theory is that the melanoblasts form melanin and their processes convey it to the basal cells of the stratum germinativum (Borrel) Melanoblasts and their processes stain black with ammoniacal silver nitrate.

In the layers lying immediately above the germinal cells are found the *Cells of Langerhans* They are not pigmented they do not stain with silver and they give no dopa reaction. But they are coloured purple-

black with gold This reaction has led to the belief that they have a nervous origin Masson however maintains that they are melanoblasts which have been carried away from the basement membrane by the upward growing Malpighian cells and that being now functionless they show alterations in their staining reactions just as the cells of the Malpighian group vary in their reactions to dyes as they progress towards the surface

The **corium, or cutis vera,** is composed of dense fibrous tissue with strands of yellow elastic tissue It contains the vessels lymphatics nerves and touch corpuscles the glandular elements and the hair follicles (Fig 2) There are two main divisions—(1) the papillary layer or pars papillaris and (2) the pars reticularis

(1) The *papillary layer* consists of finger like processes which fit into the irregularities of the mucous layer of the epidermis The papillæ are supplied with blood vessels lymphatics and fine nerve twigs and touch corpuscles

(2) The *reticular layer* is formed of bundles of connective tissue It is continuous with the papillary layer and there is no essential difference in the structure Elastic tissue fibres are met with in varying quantity in this layer It is traversed by the vessels nerves and glandular structures and by the hair follicles

It is now believed that the true skin does not normally produce pigment

The **subcutaneous tissue** or hypoderm consists of loose connective tissue bundles containing masses of fat-cells in their meshes The sweat glands and the deep hair follicles reach the hypoderm

The vessels of the skin The integument is supplied by two plexuses of small *arteries* Where the skin is movable as over joints they run a very sinuous course so that they are not constricted even when stretched These arteries form an irregular network with many anastomoses beneath the corium From it arise small branches which run perpendicularly to the surface to form the sub-papillary plexus which lies immediately below the papillary layer The meshes of the plexus are small varying from 0·2 to 2 sq mm in area They are smallest in parts exposed to pressure such as the hands and feet

From the sub-papillary network branches of supply pass to the papillæ and to the cutaneous glands One twig supplies a small but variable number of papillæ Each papilla is fed by a central capillary loop from 0·2 to 0·4 mm long The arterial feeder is narrower than the efferent vein It is to be noted that true capillaries are infrequent in the skin except in the papillæ

The *veins* are found in four layers The most superficial lies at the bases of the papillæ This communicates with the next layer and combined they form the sub-papillary plexus The next venous layer is adjacent to the sub papillary arterial plexus and the deepest lies at the junction of the skin and the hypoderm It will be recognised that the venules are far more numerous than the capillaries and in many cases there are direct communications between the two systems Such must not however be confused with the minute organ known as the glomus to be described later

The superficial venous and arterial vessels and the capillaries are formed of endothelium only They are grouped together by Lewis as "minute vessels." It is these vessels which contract on stroking or stretching the skin and produce the "white reaction" independently of the nervous system. They also react to adrenalin and pituitary extract

Valves are absent from the venules of the skin except in the deep vessels which form the plexus between the cutis vera and the hypoderm.

The glomus[1] P Masson has given this name to a special type of arterio-venous anastomosis which is normally present in certain areas of the skin. The glomus is an ovoid or spheroidal organ from 60 to 200μ in diameter It consists of one or more tortuous or coiled vessels derived from a terminal arteriole before the latter breaks up into the capillary plexus. It forms a direct communication between the arterial and the venous system. It has a double innervation being supplied by both myelinated and sympathetic fibres. An interesting feature is the fine plexus of nerves found around the afferent vessel which Masson has likened to the silk net round the bag of a Paquelin cautery

These anastomoses vary in number in different areas They are most abundant in the exposed parts of the skin *e g* the extremities of the limbs the ears, the nose and around the mouth the neck and the erectile organs. They are sparse on the trunk and on the arms and legs. Different authorities give widely varying figures as to the number of these minute organs per square centimetre of skin. It is, however established that they are most numerous in the nail beds and on the palmar surface of the fingers, their number progressively decreasing as one approaches the palm or the sole. They are not found on the dorsal aspects of the fingers or toes. Masson points out that the glomus is homologous with Luschka's (coccygeal) gland.

The functions of the glomus may be deduced from its structure and much has been learned from the researches of Grant and Bland and E. R and E. L. Clark. The fine nerve plexus mentioned appears to have the function of directing the blood flow either into the glomus or into the capillary system. That is the current can be switched directly from the arterial to the venous side through the glomus or through the capillary system. It has been established that the glomus has a rhythmical contractility independent of the pulse and it has been likened to a miniature heart.

It is assumed that it may play an important part in the regulation of heat, but it does not appear to have a direct connection with thermic reception because no glomus is found on the dorsal surface of the hand and fingers. It appears likely that these minute erectile anastomoses have the function of regulating interstitial tension and thus favour the activity of the tactile organs of the skin.

Further investigation will no doubt throw more light on the connection between the glomus and disease. It is believed that it may be involved in the production of diabetic gangrene angio-keratoma and the thrombo-angiitis of Buerger Masson has shown that there are glomic tumours which he called *angio-myo-neuromes arteriels* (p 71).

A well-illustrated article on the cutaneous glomus will be found in the

[1] Glomus-eris (neuter), ball of thread. Hor

Bulletin de la Soc Franç de Derm et de Syph (Strasbourg Reunion) 1935 VII p 1174 with full references

Lymphatics According to Sampson Handley the lymph vessels begin as blind channels forming the core of each skin papilla These papillary lymphatics pass perpendicularly through the skin and then enter a connecting vessel which drains a small number of neighbouring papillæ The general appearance of such a group resembles a stag horn with the antlers This unit drains a small roundish area of skin

The communicating vessel passes deeply into the subcutaneous tissue where others may join it Just above the deep fascia the vessels enter into a network which constitutes a sort of lymphatic pool This deep network lying on the fascia extends over the whole of the cutaneous system, and from time to time afferent vessels which have valves pass from it to the lymphatic glands

The **nerves of the skin** are (1) medullated nerve fibres terminating in touch corpuscles at the apices of the papillæ and in the Paccinian bodies in the hypoderm (2) non medullated fibres which pass through the corium and apparently end in the stratum mucosum of the epidermis The innervation of the glomus has been referred to above Many nerves of the *skin terminate in several types of end-organ the different functions of* which are not fully understood The *Paccinian corpuscles* or corpuscles of Vater are found in large numbers in the subcutaneous tissue of the palms and soles and the pulp of the fingers and toes It is believed that they are designed to estimate deep pressure But they are also found in the skin of the prepuce and labia majora

The organs of *Golgi* are supposed to determine slight pressures They are also found in peri articular and tendinous tissue

The organs of *Ruffini* are minute bodies found in the upper part of the panniculus adiposus Their exact function is not clear

The *tactile corpuscles* of Meissner (or Wagner) are found chiefly in the papillæ but also in other parts of the corium They vary in number in different areas but are most numerous on the terminal phalanges of the fingers

The *touch-cells* of Merkel or Ranvier are found in the epidermis They occur chiefly where the tactile corpuscles are less numerous *e g* on the skin of the abdomen But Ranvier showed that they were also present at the finger tips and on the sole

Woollard has described fine fibrils 3 μ in diameter in the sub-epidermis just under the stratum Malpighii which finally become more tenuous and assume a dotted irregular varicose form Some end in a closed loop and others end as naked neurofibrillæ with no sheath of any kind Such terminal fibrils may be associated with the more highly organised fibrils ending in Meissner corpuscles or in relation to hairs Krause s end bulbs and the like *Woollard believes these fibrils belong* to the pain system and that they are also protective to the more complex nerve-endings

Muscle Striated muscle is found in the platysma of the face and neck The *arrectores pilorum* are of smooth muscle they run obliquely downwards to the root of the hair and have the power of erecting the hair The skin of the scrotum also contains smooth muscle

THE GLANDS OF THE SKIN

Ranvier has differentiated two types

(1) True secreting glands which he termed Merocrine glands.

(2) Holocrine glands the secretion of which consists of degeneration and disruption products of the gland cells *e.g.*, the sebaceous glands

The sweat or coil glands are long narrow tubes extending from the sweat pore to the subcutaneous tissue In the epidermis they are coiled spirally while in the corium they run nearly straight and end in a coil which is copiously supplied with blood vessels.

The sweat glands are examples of merocrine glands and Schiefferdecker (1921) has shown that there are two distinct types

The small coil glands by far the most numerous he calls the *eccrine* glands. These are true secreting glands and have no relationship with the hair follicles. In the axillæ genital regions and breasts certain large coil glands are found which Schiefferdecker calls *apocrine* glands He considers that these are developed from the walls of hair follicles above the sebaceous follicles and that some of the secreting cells give part of their substance to the secretion. The apocrine glands are odoriferous and being more active during menstruation and pregnancy may be regarded as cutaneous sex glands It is from these glands that the lesions of Fox Fordyce disease arise (p 100).

The sebaceous glands are usually in relation with the hair follicles, but on the edge of the lip and on the penis they are independent of the hairs They consist of acini opening into a duct which communicates with the hair follicle In some parts of the skin they are of large size and the hair follicle in connection is comparatively small and unimportant Such large sebaceous glands are seen on the nose and in the naso-labial furrows etc On the other hand, on the hairy parts of the body the scalp and face the hair follicles are large while the small sebaceous glands are sacculated diverticula opening into the upper part of the common pilo-sebaceous duct.

The Hair

The hair is a modified epidermal structure. It consists of a shaft above the level of the surface of the skin, a root in the skin, and a bulb at its lower end. The bulb is concave on its under surface and stands on the papilla containing the vessels for the nourishment of the hair Each hair is contained in an invagination of the skin called the follicle The follicle is a narrow cylindrical tube formed partly of the dermis and partly of the epidermis

The wall of the *hair follicle* consists of (1) a dermic coat, composed of an external longitudinal layer of fibrous tissue a middle layer of transverse fibres and an internal glassy homogeneous layer ; (2) an epidermic coat consisting of a layer continuous with the prickle-cell layer of the epidermis the external root-sheath and an internal root-sheath consisting of the layers of Henle and Huxley and the cuticle

The hair itself is covered with a fine cuticle within which lies the cortex, comprising the bulk of the hair-substance its long spindle-shaped cells containing the hair pigment. The cortex surrounds the cavity containing

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Woollard has described fine fibrils 3 μ in diameter in the sub-epidermis just under the stratum Malpighi which finally become more tenuous and assume a dotted irregular varicose form. Some end in a closed loop and others end as naked neurofibrillæ with no sheath of any kind Such terminal fibrils may be associated with the more highly organised fibrils *ending in* Meissner corpuscles or in relation to hairs Krause s end bulbs and the like Woollard believes these fibrils belong to the pain system and that they are also protective to the more complex nerve-endings

Muscle. Striated muscle is found in the platysma of the face and neck. The *arrectores pilorum* are of smooth muscle they run obliquely downwards to the root of the hair and have the power of erecting the hair The skin of the scrotum also contains smooth muscle

In the *yellow* races, the hair is usually black and straight The hair shaft is round

In the woolly-haired *negro* there are peculiar features On section the shaft appears as a flat ellipse Owing to the shape of the follicles each hair has an axial twist the shaft being rotated to produce a watch-spring effect. Further the follicles are grouped and this grouping with clear interspaces gives the "pepper-corn" appearance of the arrangement of the hair in the ulotrichian races This "woolly" characteristic is a dominant feature in hybrids with the negro and is seen in the South Sea Islanders Hottentots Filippinos etc It tends to persist in spite of cross-breeding

The hair of Europeans and others living in temperate regions grows more rapidly than normal while they reside in the tropics.

Red hair The nature of the pigment causing the red colour is still undetermined It is said to be due to oxidation of melanin

In many young negroes the hair has a decidedly reddish tinge which disappears as they approach puberty

Lanugo hair is present on the bodies of Congo pygmies and may be found sparsely on the scalps of Bushmen

The Nails

The nail is an epidermic plate lying on the nail-bed. At the proximal end is the matrix, the distal edge of which is visible as a pale crescent the lunula. The ungual plate is composed of flattened keratinised cells The matrix consists of cells similar in their arrangement to those of the corpus mucosum elsewhere; deep cylindrical cells then polygonal cells flattening as they approach the surface The stratum granulosum is replaced by a fine granular layer containing keratohyalin the onychogenic substance

The nail-bed is covered by a mucous layer; there are no papillae in the dermis but longitudinal ridges and furrows take their place The lunula or white crescent at the root is less translucent than the rest of the body of the nail. The thin skin which forms over the surface of the base the eponychium, is the remains of the epidermic covering which envelops the whole nail in the fœtus Like the hair the nails of people living in temperate regions grow more rapidly while they reside in the tropics The nail of the negro is like his hand, long and narrow Melanin is present but is mainly in the deep layers

FUNCTIONS OF THE SKIN

It is perhaps not always realised that the skin is one of the most important organs of the body and that it has many functions

(1) It protects the underlying tissues by the horny layer of the epidermis and by its pigment
(2) It receives and transmits sensory impressions of various types to the central nervous system. (The integument is the largest sensory organ.)
(3) It regulates the heat of the body
(4) It excretes water and waste products
(5) It secretes sebum to assist in the protection of the epidermis

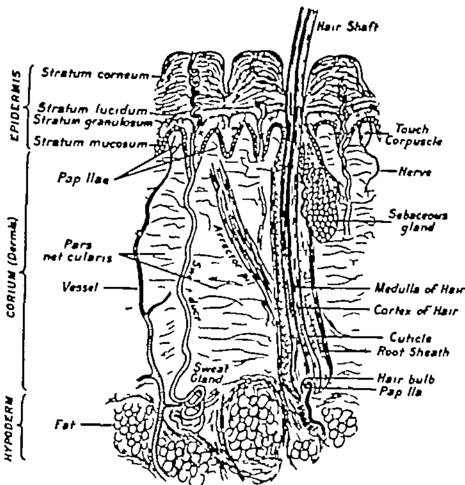


FIG 2. Vertical section of the skin (diagrammatic)

the medulla Near the papilla the medullary cells resemble prickle-cells, but later these cells shrink leaving air spaces

Fœtal hair is of the lanugo type In the normal hair change after birth these are replaced by new hairs which on the scalp are of adult type but mostly elsewhere are of the downy pre natal type

Hair "trends The distribution of the "trends" of the hair have been extensively studied Apart from the differences due to sex which are manifested at puberty (e.g the upward extension of the pubic hair in the male) it is found that the main trends on the trunk are based on whorls in each axilla Thence the streams pass up to the head and neck down the arms across the thorax and abdomen and down the legs The general direction of the hair is determined by the obliquity of the follicles in the skin

On the scalp the base is a whorl (or two whorls) over the occiput and whorls at the medial end of the eyebrows There are innumerable patterns which may be distinctive even in the infant at birth There is far greater variety in the trends of the hair than in Langer's lines on the skin and Wood-Jones found no relationship between them

Racial differences. The colour of the hair varies most in the *white* races and is often a strong family character The hair may be straight, wavy or curling On transverse section the shaft is oval.

In the *yellow* races the hair is usually black and straight. The hair shaft is round.

In the woolly haired negro there are peculiar features. On section the shaft appears as a flat ellipse. Owing to the shape of the follicles each hair has an axial twist, the shaft being rotated to produce a watch spring effect. Further, the follicles are grouped, and this grouping with clear interspaces gives the "pepper-corn" appearance of the arrangement of the hair in the ulotrichian races. This "woolly" characteristic is a dominant feature in hybrids with the negro and is seen in the South Sea Islanders, Hottentots, Filippinos, etc. It tends to persist in spite of cross breeding.

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region on the nipples and the hypogastrium They vary in number with age and race and have a sexual significance their function beginning at puberty They are said not to lose their function with advancing age They are thrice as numerous in the skin of the negro as in the European. They confer a distinctive odour on the individual which is especially evident (to the European) in the African native

Whitehouse Hancock and Haldane found that during rest under ordinary conditions of temperature the greater part of the moisture given off by the skin passed through by osmosis or diffusion The osmotic passage increases rapidly as the temperature rises and thus regulates body temperature The osmosis of water is the only available mechanism in the rare cases where the sweat glands are absent and failure of sweating in hot climates predisposes to heat exhaustion Thus subjects with xeroderma are ill-adapted for service in the tropics

Sweating occurs in response to emotion mental effort or to sensory stimulation and the areas most affected are the palms the soles and the axillæ The relationship of sweating to the integrity of the peripheral nerves is dealt with on p 20 Kuno has shown that a considerable proportion of morphologically normal sweat glands are inactive and cannot be stimulated to activity by high temperatures or by pilocarpine Their function is a matter of doubt

The sweat is a colourless, opalescent fluid with a saltish taste and a special odour It gives an acid reaction on the greater part of the surface but in certain areas is neutral or slightly alkaline (*vide* pH of the skin p 15) It is alkaline in the herbivora Its specific gravity is 1 001 to 1 010 Sodium chloride is always present and other alkaline salts Fats fatty acids and cholesterol are constant and it appears to be certain that they are excreted by the sweat glands as well as by the sebaceous glands Globules of fat have been demonstrated in the coiled tubes and duct. Lactic acid is found after exercise Urea is said to be present under normal conditions and undoubtedly occurs in considerable amount in renal insufficiency Glucose is excreted in the sweat in diabetes and in severe cases may appear as " frost on the skin

When the temperature of the atmosphere is at or above that of the skin a litre of water (35 oz) must be evaporated hourly Miners working with a wet bulb thermometer at 85 F lose two pints of water per hour the maximum recorded being 4½ pints Sir Charles Martin calculated that from one third to two-thirds of an ounce of sodium chloride may be lost in twenty four hours

While thermal sweating is more or less general emotion, fear and other nervous influences chiefly affect the sudoriparous glands of the axillæ palms and soles Paralysis of the central sympathetic in man causes sweating first on the paralysed side Similarly diseases of the spinal cord may be attended by hyperidrosis and also by anidrosis After plastic operations the grafted skin does not sweat until it has regained sensation

Grafts of a patient's own skin—known as autoplasts "—used to cover a denuded surface will survive when the conditions are favourable Grafts taken from another individual—" homoplasts —may show at first every indication of having " taken including vascularisation but in almost every instance in from ten days to three weeks the tissues of the host will have dealt with the

homoplast as a foreign body and it will be cast off The only exceptions are the rare cases in which the graft has been taken from the subject's monozygomatic twin.

The composition of the blood materially affects diaphoresis, decrease of oxygen or increase of carbonic acid in the blood producing sweating It is interesting to remark that all febrile states are not attended with excessive activity of the sudoriparous glands cf the dry skin of pneumonia and the sweating of acute rheumatism.

Sweating is influenced also by certain drugs camphor acetate of ammonia and pilocarpine stimulate while atropine depresses the activity of the glands.

The sebaceous glands (Lat sebum tallow) are single or lobulated sacs in connection with the hair follicles They are present in every part of the skin except the palms and soles and the dorsal aspect of the terminal phalanges. Sebaceous glands are most numerous in the middle line of the chest and back and on the scalp nose lips and chin The ceruminous glands of the ear and the Meibomian glands of the eyelid the areolar glands of the mamma are modified sebaceous glands. The sebaceous glands lie in the angle between the muscles of the hair and the hair follicles and these unstriped muscles on contraction compress the sebaceous glands The sebum, so far as it can be analysed apart from the sweat appears to consist of esters and high molecular alcohols with some protein and inorganic salts, and a small proportion of true fats

The minute sebaceous glands which appear after puberty on the lips and buccal mucosa of some subjects are sometimes called "Fordyce's disease They have a yellowish tint and are more common in the male than in the female They have no pathological significance but may be mistaken for the papules of lichen planus

The activity of the sebaceous glands depends entirely on their vascular supply The secretion is small in childhood but increases greatly at puberty persisting through adult life with marked variation in different subjects and diminishing if atrophy of the glands occurs in the senile There appears to be a direct connection between the internal secretion of the genital glands and the sebaceous glands (*vide* Acne vulgaris p 210) Diets rich in fats and carbohydrates have an influence on the activity of these glands in the human subject.

The function of the sebaceous glands is to provide a fatty material which, in combination with products of the epidermal cells gives protection to the surface and suppleness to the skin and hair

Prolonged soaking of the skin in water or the use of alkaline solutions removes this greasy protective layer and renders the skin more vulnerable to outside influences This is more marked on the palms and soles because these parts do not possess sebaceous glands

pH of the normal skin. Marchionini of Ankara has made a prolonged study of the surface reactions of the skin and has produced evidence that these reactions play an important part in the localisation of infections. The acidity or alkalinity of the surface varies with the amount and nature of the sweat and of the secretion of the sebaceous glands Eccrine sweat gives an acid reaction varying on the average between pH6 and pH4 Marchionini and his colleagues however found that there are lacunae or

as they call them physiological gaps in the acid envelope which determine the localisation of bacterial and mycotic infections The areas involved and their average pH are —

Axillæ Centre 7 13 margin 6 58
Male genital area Hairy part 5 22 inguinal fold 6 81
Female genital area Hairy part 5·47 inguinal fold 6·46 labia majora 6 57
Anal region 6 31
Feet Interdigital clefts 6 84 heel 7 84 Sole middle 6 86 anterior part 7 27 arch (inner side) 5 08

At the edges of the "physiological gaps the reactions gradually shade into those of the surrounding areas

Regions with feebly acid neutral or alkaline reactions, like the anal, the axillary and inguinal folds and the toes provide the optimum physico-chemical milieu for the growth of bacteria and fungi which flourish at or about the neutral point For instance Marchionini found that the epidermophyton inguinale grew best on a medium with the pH 6 8 to 7 2 The most resistant parts to microbic and fungus invasion are the surface *of the forearm the thigh the abdominal wall and the inner side of the* sole of the foot

Pathogenic fungi are highly resistant to acid hence they grow well on Sabouraud s medium which is too acid for bacteria

It is of interest to note that the bactericidal power of the skin is as Marchionini found experimentally and Colebrook clinically more potent against the pyogenic streptococci than other organisms

MICRO-ORGANISMS ON THE NORMAL SKIN

Micro-organisms on the normal skin have been divided into resident and transient. The residents are chiefly harmless saprophytes staphylococci diphtheroids and micro-cocci *Staphylococcus aureus* is not uncommonly present. The transient invaders are *Streptococcus pyogenes Staphylococcus aureus* members of the coliform group and the *Coryne bacterium diphtheriæ*

Efficient applications for sterilising the skin surface are —

Iodine 2 per cent in 4 per cent potassium iodide in water
Liquor antisepticus (Nat Form)
Chloramine 1 in 100
Dettol (chloroxylenol) 1 in 20

One of these applied for two minutes after washing the hands in hot water and household *soap (which is itself bactericidal) for four* minutes is held to be adequate preparation of the surgeon s hands before operation. It is essential that the hands are free from breaches of surface and are healthy A suitable hand lotion or cream should be used regularly

Absorption by the skin. There seems to be no doubt that salts dissolved in water cannot be absorbed unless the normal fatty material in the epidermis has been removed Absorption, of course may take place easily through wounds or abrasions or conditions in which the epidermal covering has been removed Experiment has shown that when unguentum hydrargyri is rubbed into the skin as in the treatment of syphilis minute

globules of mercury are pushed into the orifices of the sebaceous glands and sweat glands. Emulsifying bases greatly increase absorption by the skin

SENSORY FUNCTIONS OF THE SKIN

The skin is the most extensive sensory organ Like the cerebral cortex and the special visual, auditory and olfactory organs it is evolved from the epiblast. It may therefore be regarded as Comel says as a peripheral brain.

The impressions conveyed by it to the sensorium are of varied types which may be classed as informative and protective We are ignorant of the mechanism by which they are transmitted or interpreted. It has been suggested that there is a single physico-chemical stimulus but whether this is Lewis s H substance or hydrogen ions, or some metabolite is an unsolved problem.

Electrical or physico-electrical phenomena. Emotions, especially those engendered by discomfort, or threatened danger produce a change in the electrical properties of the skin This change is essentially a lowering of the resistance to the passage of a current (Féré) The change appears to be due to increased activity of the sweat glands

Cutaneous reflexes The most noteworthy is the pilo-motor in which erection of the hair papillæ "goose-flesh" may follow cold or fright Erection of the scalp hairs in terror is another example These reactions do not occur if the innervation be impaired. Reflex action of the cutaneous glands is seen in the sweating of fear and anger The pallor and blushing of fear shame etc are similar reactions

The impressions conveyed to the sensorium are —

(i) Touch. It seems probable that Meissner s corpuscles are chiefly concerned in the tactile sense. This sense includes the appreciation of contact, pressure vibration and tickling Its acuity varies remarkably in different areas. This has been estimated by altering the stimuli applied and by the recognition of double stimuli measured by the points of a pair of compasses. The tip of the tongue shows the most acute discrimination; then come the palmar aspects of the terminal phalanges of the fingers the least sensitive parts being the back and the upper segments of the limbs

(ii) Pain. It has been estimated that there are a million points on the surface which can register sensations and a large number of them give impressions of pain. Woollard s work (p 18) suggests that the epidermis itself is not the special site of painful impressions and that the fine net work of fibrils which he described as lying in the sub-epidermis is the receiving mechanism. The sensation of pain is an important part in the protective or "nocifensor" system (*vide* p 19). The referred hyper algesia associated with visceral disease may also be protective.

(iii) Itching. The immediate cause of itching is a change in the surface tension between the prickle-layers of the epidermis. This is obvious in the irritation produced by an insect bite, and a further example is the intense pruritus of obstructive jaundice due to the presence of bile-salts in the skin. Paralysis of the sensation of pain leads to the cessation of itching Kenedy has shown that total arrest of the circulation abolishes the sensation even though the pruriginous substance may be present in the skin. Itching returns when the circulation is restored. This author believes that there

is a substance P which may be produced locally and is carried to the epidermis when the circulation is intact Kenedy holds that this substance is not Lewis's H' substance His experiments confirm the opinion of Török that the receptors and nerves for the sensations of pain and itching are identical

Itching is therefore not entirely pathological it is a protective function directing attention to internal or external irritants (*vide infra* The Scratch Reflex)

(iv) **Heat and cold.** The sensibility of the skin to thermic impressions differs in different parts and is associated with the heat regulating mechanism While it is *generally believed that the skin is unable to* appreciate absolute temperatures it has a fine discrimination of variations in heat It would appear that it is more important to protect the body *against cold than against excessive heat and it has been found that there* are 150 000 cold points on the surface as against 80 000 points registering heat

Sensory Nerves

Head and Rivers divided sensory nerves into two classes —

(1) **Protopathic,** which are concerned with pain and deep sensibility and the recognition of extremes of temperature below 20° C. and above 40 C The areas overlap and the sensations are not localised accurately When the nerve has been cut the protopathic fibres regenerate rapidly

(2) **Epicritic** which discriminate light touch and appreciation of temperature between 20 and 40 C Localisation is very accurate as estimated by compass points and the size of objects is recognised The areas *do not overlap and regeneration of the nerve after section is slower*

The distinction between epicritic and protopathic impressions may be useful clinically but Trotter and others have doubted the existence of two *kinds of nerve This view is supported by Comel s exhaustive investigations,*

It is interesting here to note that the protopathic areas can be differentiated by experiments on the sweating reaction Many examples have been studied after war injuries. Total interruption of a nerve causes complete loss of sweating within the autonomous zone of the nerve Areas of overlap show more or less hypohidrosis Great variations have been found in the areas of cutaneous supply and in the extent to which adjacent nerves overlap Guttmann has shown that the sodium salt of quinizarin (a red-brown dye) diluted with bicarbonate of soda and rice starch and rubbed gently into the skin to fill up the orifices of the sweat glands turns a dark-blue-violet colour when *sweating is induced by hot* tea and aspirin The experiment takes from fifteen to forty five minutes and excellent photographs can be made defining the protopathic zones

Intra-epidermal nerve endings Woollard has added considerably to our knowledge of the relationship between nerve-endings and the sensation of pain Much of the epidermis may be shaved away without exciting a severe painful sensation Pain is relatively poorly localised *It radiates* widely and lacks discriminating value

The apparatus which Woollard believes to be directly concerned with painful sensations consists of very fine fibrils *In the deeper layers of* the dermis they are about 8μ in diameter As they approach the surface

they are even finer and frequently form a closed loop whose limbs have a dotted varicose appearance. A number of the fibrils however are simple and have no sheath of any kind. They have been observed in relation to Meissner's corpuscles, hairs, Pacinian corpuscles, Krause bulbs, etc. It has been suggested that they are part of the sympathetic system, but Woollard holds that they are more probably part of the pain system and act as protective nerves to the more complex skin organs. Experiments afford evidence that the anatomical situation of pain begins at the sub-epidermal level. The discovery at that level of a plexus and endings in sufficient abundance and of the appropriate character reinforces this conclusion.

Woollard therefore regard the epidermis as being accessory to touch and this is especially the case in regions where tactile sensation is highly developed.

"*The Nocifensor System*." Sir Thomas Lewis has given this name to the nervous mechanism which he has shown is concerned with the protection of the skin through its cutaneous reactions. This mechanism belongs to the posterior root-system but is distinct from the nerves carrying sensory impressions. All the reactions depend upon the integrity of an axon reflex. They are due in part to the release of a "reactine" or "reactines" which act locally upon the nerve-endings. These bodies of which Lewis's H substance is one are believed to be secreted by skin cells as the result of injury or from nerve stimulation. There is also a possibility that acetylcholine which is less stable than the H substance may also be liberated.

There are five types of reaction :—

(1) Spreading hyperalgesia from local injury. A tiny crush of the skin, as by nipping with forceps, causes the development of a small area of hyperalgesia in a few seconds. This area gradually spread and at the end of ten to twenty minutes, reaches its full extent. The area is usually ovoid and may be 20 cm in its long axis. It lasts for several hours in the majority of subjects. This hyperalgesia is not primarily referred from the brain or spinal cord for it occurs in a part of the area which has been rendered anæsthetic by novocain. Under such circumstances the crush is not felt but the hyperalgesia is present when the nerve recovers from the anæsthetic. The reaction is due to a local nervous mechanism. It is quite unconnected with the sympathetic for it occurs in persons whose cervical ganglia have been removed.

(2) Hyperalgesia from distal stimulation of cutaneous nerves. The stimulus is applied by the faradic current and an exactly similar reaction occurs. There are the same small rapid response and the more slowly spreading hyperalgesia which lasts for several hours. If the nerve be blocked by a little anæsthetic the hyperalgesia does not develop though the central nervous system receives the sensory stimulus. If the nerve be stimulated below the block there is no pain, but when the block recovers the usual area of hyperalgesia is found. In this connection see "Causalgia" p. 112.

(3) The "Triple Response" or "Flare" Reaction. A localised injury or irritation of the skin is followed by (i) a primary dilatation of the capillaries, a red spot or line; (ii) increased permeability of these capillaries producing an elevation of the epidermis by plasma the "wheal"; and (iii) the "flare" a wide-spread dilatation of the arterioles. A good example of the triple response is seen after a mosquito-bite. Initial redness is followed by a wheal which is succeeded by the flare. A similar reaction may be produced by pricking the epidermis with a needle through a spot of histamine solution. The reaction is held to be due to the production by the epidermal cells of a substance allied to histamine which has been called the "H" substance by Lewis. The "flare" reaction is produced by a local axon-reflex. It will be observed that the triple response may be looked upon as the vascular counterpart of the alterations in sensibility described under (1) and (2).

(4) The Antidromic Flush It has been demonstrated that all the fibres in the posterior roots are not afferent Cell stations in the posterior root-ganglia emit fibres which pass into the cord and send collaterals out again through neighbouring posterior roots to the periphery Their function cannot therefore be sensory As they run in an opposite direction to the normal sensory impulses they have been called "antidromic" The antidromic flush can be produced experimentally in animals by stimulating the vaso-dilator fibres in the posterior roots

(5) Heat Regulation by the Glomus. We have already described the "glomus" a minute specialised coil of vessels which is provided with a highly developed nervous mechanism and which is present in large numbers in those areas of the skin which are peculiarly exposed to changes of temperature The minute coils are arterio-venous anastomoses whose nervous mechanism has the power of switching the circulation through them in preference to the more leisurely passage through the capillaries Under stimulation by cold this mechanism comes into play and may be demonstrated by putting the finger into ice-cold water For some time after the immersion the temperature of the finger as estimated by a thermal junction falls to the level of the surrounding medium After an interval the mechanism of the glomus comes into play and the temperature of the finger gradually rises to a considerably higher level than the water The difference may be as much as 9 F to 18 F This reaction lasts from ten to thirty minutes when the finger cools again and the process is repeated. Similar reactions follow exposure to lesser degrees of cold This is again a protective reaction Its underlying mechanism is nervous It occurs in man after section of a mixed nerve to the skin until the nerve degenerates. It is present when the sympathetic is degenerated

Lewis says that it is tempting to ascribe all the "nocifensor" reactions to the same system of nerves and though there is much to support such a conclusion it is not yet possible to do so with certainty

With some stimuli e.g., that of ultra violet light a reaction is delayed for some hours presumably because the release of the activating substance here depends upon a slowly developing injury

Trophic nerves. It has long been held that there is a specific set of nerve fibres which are concerned with the nutrition of the skin It is now regarded as unlikely that any nerves influence the nutrition or growth of tissues except by altering the blood supply or by controlling the functions of the tissue The part played by the nocifensor system in this connection is obvious

The sympathetic and the skin. Pre-ganglionic section i.e the cutting of the white rami before they reach the ganglion cells causes an immediate flushing of the skin and a rise of temperature which may be as much as 8–10° C Sweating is completely abolished The elevation of the temperature and the flush diminish in five or six days but the hyperthermia will remain for many years after the operation especially in the lower extremities A very temporary flushing and rise of temperature may develop on the corresponding area on the opposite side

The scratch-reflex. Itching of physiological or pathological origin is protective and one manifestation of this defensive function is the Scratch Reflex. The value of the scratch reflex as a protective is particularly evident in countries where the natives especially children are constantly irritated by flies etc. It is automatic and may occur even during sleep The sensation of itching varies very much in different individuals The skin of the verminous tramp is far less sensitive than that of the clean person It must be remembered that itching may be a purely psychic phenomenon and that the thought of a parasite may be sufficient to

excite pruritus in perfectly healthy subjects. Some persons appear to be able to excite itching in certain parts by thought alone.

In dermatology itching is a far commoner symptom than pain and the scratch-reflex may become highly developed in neurotic subjects as will be seen in discussing the neurodermatoses. It is often a special feature in persons who are addicted to cocaine. At times the evident relief and sensual pleasure obtained in scratching are obvious manifestations of more serious psychological disturbances and here the scratch reflex may be regarded as a perversion.

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The sympathetic and the skin. Pre-ganglionic section, *i.e.*, the cutting of the white rami before they reach the ganglion cells causes an *immediate* flushing of the skin and a rise of temperature which may be as much as 8–10 C Sweating is completely abolished The elevation of the temperature and the flush diminish in five or six days but the hyperthermia will remain for many years after the operation, especially in the lower extremities A very temporary flushing and rise of temperature may develop on the corresponding area on the opposite side

The scratch reflex. Itching of physiological or pathological origin is protective and one manifestation of this defensive function is the Scratch Reflex. The value of the scratch reflex as a protective is particularly evident in countries where the natives especially children are constantly irritated by flies etc It is automatic and may occur even during sleep The sensation of itching varies very much in different individuals. The skin of the verminous tramp is far less sensitive than that of the clean person It must be remembered that itching may be a purely psychic phenomenon and that the thought of a parasite may be sufficient to

be of great assistance to the student in the reading of the subsequent chapters

Elementary cutaneous lesions are *primary* and *secondary* and in examining an eruption it is important to determine which is the primary element. In many cases this is fairly easy In others the history and the observation of an intelligent patient will be helpful but where there are extensive secondary changes it may be exceedingly difficult to be certain what has been the primary manifestation With the growth of experience these difficulties diminish, and there is one thing which should never be omitted, and that is the examination of the *whole* of the affected area and of the whole surface whenever this is practicable for it is highly probable that at some part often the periphery the primary lesion unaltered by retrograde or evolutionary change will be found

Primary Lesions

Macules are circumscribed, non-elevated alterations in the colour of the skin, of any size or shape Examples: the eruption of scarlet fever the macular syphilide the port wine mark.

Papules are solid, or apparently solid, elevations of the skin not larger than a pea (0·5 cm). Examples: the shotty papules of variola, flat papules of lichen planus, flat warts.

Nodules are larger swellings, but not exceeding a hazel nut in size (about a centimetre). They commonly involve the true skin. Examples: nodular syphilide nodular leprosy

Nodules were often called "tubercles," but for descriptive purposes this term is better avoided, to prevent confusion with lesions caused by Koch's bacillus.

Tumours, as their name implies, may be (1) neoplasms, malignant or benign, or (2) large inflammatory swellings *e.g.*, granulomata occurring occasionally in tuberculosis, and in a number of tropical affections of the skin.

Wheals or pomphi are circumscribed swellings caused by hyperæmia and œdema and characterised by a white centre and red margin. Examples the nettle sting urticaria.

Vesicles are circumscribed swellings of the skin smaller than a pea (0·5 cm.) containing plasma or (rarely) lymph. Examples: the eruption of chicken-pox and herpes zoster

Bullæ, blisters or blebs are larger elevations of the epidermis, containing plasma or blood. Examples: blisters caused by a scald, pemphigus.

Pustules are swellings of the skin containing pus. Examples: common acne abscess whitlow

Secondary Lesions

The primary lesions mentioned above may pass by evolution or devolution into other forms or they may be modified by super-added conditions. Thus a vesicle may dry up to form a crust or scab or it may pass into a pustule The secondary lesions are important because they are often the most prominent feature when a case comes under observation.

CHAPTER II

MORPHOLOGY OF SKIN DISEASES

The student beginning the study of dermatology is frequently bewildered and may actually be deterred from its pursuit by the complexity of its nomenclature. The terminology is, however, the least important part of the subject, and we cannot too strongly advise the novice to get rid of the common idea that a knowledge of skin diseases consists in the application of polysyllabic appellations and in attaching to each of them one or more appropriate prescriptions. The study of cutaneous affections is much more interesting and affords an admirable training in observation. In no other branch of medicine can so much be learned from the objective phenomena. The lesions lie spread out before the eye, and with the assistance of a lens and a microscope their most important characters can be studied. Exactitude of description is to be aimed at, and to attain this it is a useful practice to sit down in front of patients and to write out in simple language what is to be seen. Diagrams should also be made of the distribution of the lesions, and if the observer can use his pencil he will derive great help from sketches. Systematic observation of cases in the out-patient clinic and in the wards will soon make the student familiar with the essential features of the commoner skin diseases, and the nomenclature will come gradually and easily.

The objective phenomena are also valuable aids in determining appropriate treatment. Certain diseases of the skin are reactions to local irritation, others are caused by animal or vegetable parasites, while some depend upon microbic infection and toxic conditions of the blood. In these we are often able to effect a cure by the removal or destruction of the cause. Thus an eruption of scales may be due to a fungus, as in tinea versicolor, and the organism can be destroyed by the application of parasiticidal remedies. Another scaly affection is caused by the *treponema pallidum*. Salvarsan given internally causes the disappearance of the lesions by its action on the parasite in the blood.

But we are still ignorant of the causation of some of the commonest skin diseases. Treatment under such conditions, unless absolutely empirical, must be symptomatic, and to be successful the symptomatic treatment of cutaneous affections depends upon the accurate observation of the elementary lesions. Suppose we have before us an eruption of scaly patches whose cause is unknown. We may treat the condition empirically or rationally. Rational treatment will direct the application of remedies which are known to influence the keratin formation of the epidermis. Such remedies may be applied locally or administered internally. Our success will depend upon the exact interpretation of the objective phenomena, and not upon the name or label which we attach to the disease.

To facilitate accurate description it is necessary to know the meaning of certain terms which are applied to the elementary lesions of skin disease, and a little time spent in mastering the short vocabulary which follows will

not congestive and the history of their congenital origin is usually obtainable

Erythemata are described as macular scarlatiniform morbilliform diffuse, polymorphous etc. according to their distribution and characters The names are sufficiently distinctive and require no further definition

Causes of erythema. Erythema may be active or passive In the active form the colour is bright red and the surface feels hot to the touch. The redness is due to active dilatation of the capillaries In the passive variety the colour is livid or purplish and the surface is cold The cause is stasis in the small blood vessels. In some conditions passive congestion takes a reticular form from the arrangement of the venous plexuses (*vide* Livedo p. 804)

Active erythema occurs as a result of local irritation from friction, pressure heat cold, light X-rays, radium, and from some chemicals including drugs locally applied (Chapters XVI XVII), and from irritating plants and toxins

It is also a prominent feature in the exanthemata, the eruption of syphilis (p 531), leprosy (p 509) and in septic and toxic diseases The importance of toxæmia in the causation is discussed in Chapter XIII Erythema may also follow the internal administration of a number of drugs (p. 283).

Passive erythema occurs on the extremities in some apparently healthy children and adolescents and in cachectic conditions particularly in tuberculosis. The term "acrocyanosis" (Gk. *akros* terminal) is applied to passive congestion of the extremities A lividity of a reticular character is frequently described a livedo Passive erythema is intensified by cold weather

Erythemato-squamous eruptions (Gk *squama* scale). In a considerable number of skin affections the lesions are characterised by congestion and by scaling Psoriasis is perhaps the commonest of these The lesions are congested areas covered with masses of silvery scales (p 230). In the squamous form of seborrhœic dermatitis the scales are greasy (p 701). In pityriasis rosea (p 224) the patches are rose coloured and covered with fine scales Some forms of tinea and erythrasma form scaly patches on a congested base (p 896). Lichen planus lupus erythematosus mycosis fungoides and certain toxic and drug eruptions, particularly those due to toxic metals, *e.g.*, gold, bismuth, arsenic, not infrequently show erythemato-squamous eruptions The squamous syphilide has scaly and congestive characters (p 537) Some rare chronic conditions of this type simulating psoriasis are called "parapsoriasis" (p. 239).

Erythrodermia is the name given to *generalised*, persistent, inflammatory conditions of the skin attended with scaling which is often profuse, a regular exfoliation. The erythrodermias may be primary or secondary The primary forms are classed as exfoliative dermatitis and pityriasis rubra (p 275). Generalised redness with scaling may also occur in the premycosic stage of mycosis fungoides (p. 185) and in certain blood affections including leukæmia (p 141) The secondary conditions may follow eczema psoriasis, and pemphigus foliaceus (p 654) and the administration of certain drugs (p 284).

Urticaria (Lat. *urtica*, nettle) is a condition of localised hyperæmia with œdema. It is characterised by the formation of wheals or pomphi.

Scales or squamæ are dry exfoliations of the epidermis Example the lesion of psoriasis is covered with a silvery scale

Crusts or scabs are dried masses of exudation and other products of inflammatory action Example the scab of common impetigo

Excoriations are superficial lesions characterised by removal of the epidermis Examples abrasions caused by injury or scratching

Fissures or rhagades are linear breaches of the surface extending usually to the papillary layer They occur in the normal fissures of the skin and rarely leave scars Examples the cracks on the hands associated with chapping and chronic eczema

Ulcers are circumscribed lesions characterised by loss of substance *of the* corium or true skin Examples varicose ulcer, gummatous ulcer

Scars or cicatrices are new formations of connective tissue to replace loss of substance of the corium It is *important to remember that scars only* occur when the true skin is involved Examples cicatrices of burns and of syphilitic ulcers

Stains are local discolorations of the skin from (1) extravasation of blood (2) diapedesis in inflammation (3) from fixed eruptions (4) in xanthomatosis (5) deposition of minerals and (6) the local application of pigments and certain drugs Examples the stains left by a bruise by a syphilitic eruption and by picric acid

"**Ide**" The syllable "ide denotes an eruption usually symmetrical and localised or generalised indicating specific allergic sensitisation to some blood borne toxin or infection *e.g* syphilide epidermophytide streptococcide etc Darier introduced the term tuberculide in relation to such eruptions which he attributed to tuberculous disease Sometimes the suffix is attached to the type of reaction *e.g* eczematide In America the suffix is commonly spelled " id

Ide must be distinguished from oid meaning like as in diph*theroid* typh*oid* fun*goid*

General Morphology

Assuming that the vocabulary of terms is mastered it will now be useful for the student to consider the general morphology or forms of eruption and other morbid conditions of the skin In this section we shall indicate the essential features of each group and with a view to helping those unfamiliar with the subject we have appended to the brief description of the form of eruption under consideration a list of the important conditions in which it occurs with references to the chapters in which the details are discussed We believe that such an arrangement will be of use also to those who have lost touch with the skin clinic and that a summary of the important *affections characterised by erythema or papules* to take examples will refresh the memory and assist in diagnosis

Erythema (Gk *eruthema* be red) is the name given to redness of the skin of a congestive character The colour disappears under pressure but returns when the pressure is removed This feature distinguishes erythema from hæmorrhage into the skin which is unaffected by compression Cutaneous nævi are excluded from the erythemata because they are

irritation (p. 870) and in the reaction of the skin to heat, cold and actinic light (p. 303). Vesicles are characteristic of eczema and eczematised conditions (p. 147). They also occur in scabies (p. 837) and in some forms of ringworm (p. 306) either as a response to infection or as an "ide" reaction (p. 424). Cheiropompholyx is a vesicular eruption (p. 10*)

Grouped vesicles on an erythematous base are seen in zoster (p. 0*1) and herpes (p. 617), and in association with bullæ in dermatitis herpetiformis (p. 645). The eruption of strophulus may be vesicular or bullous as well as papular (p. 262). Sudamina are dealt with among the affections of the sweat glands (p. 727).

Bullous eruptions (Lat *bulla* bubble). Blisters or bullæ are caused by the elevation of the epidermis by serum or blood. They may be the result of trauma or of irritation by heat, cold, and light or by contact with certain plants or vesicant drugs (p. 843). In the congenital anomaly called epidermolysis bullosa blisters develop in response to slight degrees of pressure or friction (p. 42). Coccal infection causes bullous impetigo including the so-called pemphigus neonatorum (p. 443) while the treponema is responsible for the bullous congenital syphilide (p. 533).

The most important group of bullous eruptions are the varieties of pemphigus (p. 640), dermatitis herpetiformis (p. 645) and hydroa (p. 812). With the exception of the acute malignant form of pemphigus, which is believed to be microbic, the etiology of these affections is unknown.

Circulating toxins produce bullæ as an epiphenomenon in some forms of erythema (p. 244) and urticaria (p. 250), and closely allied to these are the bullous drug eruptions (p. 283). In Morvan's disease and in nerve-leprosy bullous lesions also occur (p. 112). A bulla also is situated at the orifice of exit of the Guinea worm (p. 880).

Pustular eruptions. Pustular affections of the skin are primary or secondary. The lesions may form in the superficial layers of the epidermis or in the deeper structures and in the follicles (see p. 453). Pustules may be of any size, rounded or oval in shape, tense or flaccid, and they are often surrounded by a red areola. In many cases when the lesions first come under observation there is already a transformation into crusts or scabs.

The eruptions of variola and vaccinia (and occasionally varicella) become pustular. The commonest causes, however, are streptococcal and staphylococcal infection. Impetigo (p. 443) and ecthyma (p. 447) are instances of primary coccogenic conditions, but many forms of irritant dermatitis, eczema and itching eruptions become "impetiginised," *i.e.* secondarily infected with pus-cocci (p. 158). Some varieties of ringworm (p. 306) are characterised by the formation of pustules. Psoriasis and certain toxic eruptions, e.g., pustular bacterides, may present pustules usually sterile and affecting the extremities.

Ulceration. Ulcers vary very much in their characters. They may be rounded, oval, polycyclic, reniform, etc. The edge may be well or ill-defined, steep, shelving, punched out, undermined, or everted. There may be infiltration, while the base may be irregular, covered with granulations or with a slough, and the discharge may be clear, purulent, or bloody. Ulcers run an acute or chronic course. They occur as a result of physical irritation—from injury, heat, cold, X rays, and chemicals (Chapter XVI), from microbic infection, as in soft sores (p. 588), syphilis

It occurs as the result of local irritation *e g* the nettle sting and the bite of the bug and of trauma such as the blow of a whip or cane It *frequently follows* the ingestion of decomposing or unsuitable food Drugs *e g* copaiba aspirin sera and enemata may also cause it (p 257) It is common as a psycho-neurosis but is *rarely seen in organic nervous disease.* It is an occasional feature of the premycosic stage of mycosis fungoides (p 187)

Cutaneous hæmorrhages are characterised by red macules which do not disappear on pressure At first they are bright red then purplish and *finally brown or greenish* in tint They occur as the result of injury including the bites of insects or from venous congestion as in varicose veins but an eruption composed of *hæmorrhages into the skin is usually* caused by circulating microbes or toxins as in the hæmorrhagic fevers cerebro spinal meningitis septicæmia and toxæmia Cutaneous hæmorrhages are also seen in certain blood diseases pernicious anæmia leukæmia scurvy hæmophilia and in grave visceral disease especially of *the liver and kidneys The name purpura is applied to many of these* eruptions and if the cause is known they are classed as symptomatic purpura while those of unknown origin are grouped as idiopathic purpura (p 204)

Papular eruptions. Papules may be inflammatory or non inflammatory Those which are confined to the appendages of the skin are dealt with later (see Follicular Affections p 700)

Papules may be of the normal colour of the skin or red or brown in tint They are described as flat conical acuminate pointed hemispherical etc according to their form.

Non inflammatory papules occur as congenital anomalies—certain nævi and moles as evidence of senile degeneration—senile keratoma or *of localised degeneration of the skin or of the deposition in the skin of* degeneration products—xanthoma and from contagion—the common wart and molluscum contagiosum and as new growths benign or malignant

Inflammatory papules appear in variola varicella and vaccinia and some other fevers *e g* measles typhus typhoid and in syphilis (p 534) tuberculosis (p 400) and leprosy (p 500) In some forms of ringworm the *lesions consist of a ring of papules (p 396)* Pustules often begin as papules.

Papules are characteristic of lichen planus (p 178) of the itching eruptions classed as prurigo (p 171) and of strophulus or gum rash of infants (p 262) They also occur in certain varieties of eczema (p 152) and erythema (p 244) and from local irritation Both the local application and internal *administration of certain drugs may be attended by a papular* eruption (p 283)

Diffuse papular conditions occur as a sequel to chronic irritation chronic eczema prurigo and many itching diseases To these secondary developments the term lichenisation is often given (p 154 206)

Vesicular eruptions are produced *by an effusion of plasma in the* epidermis In extremely rare cases the fluid is lymph (Lymphangioma *and* Lymph varix, p 57)

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Increase of pigment may be local or general. It may be —

(1) Congenital, pigmented nævus or mole

(2) Due to external irritation by light (freckles bronzing), heat (ephelis ab igne) X rays, trauma, oil of bergamot etc.

(3) Due to chronic inflammation and ulceration of the skin e.g., varicose and syphilitic ulcer

(4) A part of general disorders of endocrine metabolic or vascular origin and some avitaminoses e.g., Addison's disease Graves's disease myxœdema jaundice diabetes hæmochromatosis uterine and ovarian disease chloasma of pregnancy etc

(5) Caused by a deposition of metals and dyes (usually drugs) in the skin. These vary in tint Such may occur from the prolonged administration of arsenic silver bismuth, and gold therapeutically and in certain occupations in which absorption may occur locally or through the alimentary tract.

(6) Staining due to industry or other cause

Follicular lesions. A cutaneous affection may start in and be limited to the follicles In many forms of staphylococcal infection the organisms attack the hair follicles e.g impetigo of Bockhart, boil carbuncle sycosis folliculitis dermatitis capillitii (Chapter XXI)

Fungi often invade the hair follicles and also the hairs themselves e.g., tinea, favus (p. 412)

The sebaceous glands may be over-active as in oily seborrhœa (p 200) or they may become infected, e.g., acne (p 210) tuberculous folliculitis (p. 498) and syphilitic folliculitis (p 530)

Folliculitis of the acne type may be caused by chlorine tar and oil of cade applied locally and may follow the internal administration of bromides and iodides (p 286). Drugs or toxins excreted by the follicles may produce a punctate erythematous follicular eruption

Horny plugs are seen at the mouths of the hair follicles in vitamin deficiency (p 77) keratosis pilaris (p. 706) lichen pilaris (p 180), keratosis follicularis (Darier) (p 712), and in pityriasis rubra pilaris (p. 710). Horny plugs in sebaceous follicles occur in Lupus erythematosus (p 253)

Affections of the hair nails, and sweat glands are dealt with in Chapter XXX.

Diseases of the hypoderm. A number of affections of the subcutaneous tissue come under the observation of the dermatologist They commonly begin about the blood vessels and are doubtless often of embolic origin Such conditions occur in connection with varicose veins phlebitis and periphlebitis Syphilitic phlebitis produces a chronic form of hypodermic swelling, one form of syphilitic node (p 545). Tuberculosis is the cause of the erythema induratum of Bazin (p. 409) and various toxins, infections and drugs may cause the nodose swellings classed as erythema nodosum (p. 246) Subcutaneous fatty and other tumours are also often brought to the notice of those practising in skin diseases.

Practical Hints on Diagnosis

(1) The skin may be affected by factors (a) from without (physical chemical, biological, etc.) and (b) from within by nutritional and

(p 518) tuberculosis (p 472) leprosy (p 505) ecthyma (p 447) farcy (p 469) in certain mycotic infections sporotrichosis (p 430) blastomycosis (p 434) mycetoma (p 432) and actinomycosis (p 429) Impaired circulation is the cause of the varicose ulcer and perforating ulcer is due to nervous disease (p 119) In many tumours characteristic ulceration occurs—*e g* rodent ulcer (p 670) epithelioma (p 674) and mycosis fungoides (p 195) Phagedænic ulceration is common in the tropics (p 93)

Gangrene is local death of the skin and may result from traumatism from compression moisture and infection as in the bed sores of myelitis and the like It may also be caused by heat, cold X rays and high frequency currents and the local action of chemicals the caustic acids alkalies corrosive sublimate chloride of zinc and arsenic Gangrene of the extremities is caused by obliteration of the vessels in Raynaud's disease in diabetes in periarteritis nodosa and in ergotism (p 122) it occurs in syringomyelia and in nerve leprosy as a tropic phenomenon Necrosis of the skin is occasionally produced by direct bacterial infection as in dermatitis gangrenosa infantum (p 451)

Cutaneous atrophy may be idiopathic or cicatricial. It may be localised or diffuse The commonest forms are naturally cicatricial Cicatricial atrophy occurs after burns scalds chronic X ray and radium dermatitis and chemical irritation It may follow any deep abscess necrosis or caseation *e g* acne vulgaris syphilis follicular tuberculides varicella and zoster *It is the common sequel of ulceration of any kind e g syphilitic* lupoid leprous ulcers In lupus erythematosus and the dry forms of lupus vulgaris it is the result of interstitial inflammation It occurs rarely in *lichen planus certain nervous diseases in endocrine disorders, and idiopathically* Stretching of the skin is the cause of striæ atrophicæ (Chapter XXVIII)

***Sclerosis of the skin** (Gk skleros hard) is characterised by thickening* and toughening of the integument which may feel like a piece of ivory It may be generalised as in sclerodermia or localised as in sclerodermia *morphoea sclerodactylia and sclerodermatomyositis a group of conditions* related clinically if not etiologically (p 192) and in the tropical disease *called ainhum (p 694)*

Facial hemiatrophy is an interesting form probably of nervous origin. Pachydermatous conditions occur in chronic congestive conditions notably in connection with varicose veins and in chronic lymphatic obstruction *e g* elephantiasis

Hypertrophy of the skin occurs in elephantiasis and pachydermia (p 127) in the rare condition known as trophœdema (p 58) in *rhinoscleroma (p 510) and rhinophyma (p 220)*

Dyschromias Dyschromias are discolorations of the skin They may be due to increase diminution or absence of the normal pigment or to a deposit of *hæmosiderin or certain metals* Dyschromias may be local or general

Absence of pigment may be congenital as in albinism. It may follow certain infections *e g* syphilis yaws pinta It is occasionally seen in avitaminosis but in some cases *e g* vitiligo (leucoderma) the cause is unknown

eruption of the hands and feet in children is usually caused by scabies or papular urticaria

(19) A scaly patchy baldness of the scalp in children should be regarded as ringworm until a careful examination proves otherwise

(20) Look for enlargement of the lymphatic glands and spleen in purpura and examine the blood.

(21) The development of a non inflamed papule or nodule on the skin, especially in patients over 40 should make one suspect malignant disease

endocrine nervous disorders and by poisons and toxins circulating in the blood

(2) Whenever possible examine the whole skin surface at any rate examine every part of an eruption Its distribution may be the important diagnostic feature and in outlying areas early stages of the condition may be the deciding feature

(3) An examination of the tongue buccal mucosa and the nails may assist diagnosis

(4) Consider sex and age Many skin diseases are relatively peculiar to one sex or age period *e.g* Bazin s disease erythrocyanosis crurum rosacea acne strophulus and tinea tonsurans

(5) A skin eruption which is asymmetrical or local is most likely to be caused by an external influence Tertiary syphilis accounts for certain exceptions

(6) *Hyperkeratosis of one palm or one sole should suggest late syphilis*

(7) When sepsis is symmetrical it is usually secondary to chronic parasitic infestation or to eczema or urticaria

(8) A bilateral or symmetrical dermatosis may sometimes be due to equal exposure of the two sides to extraneous influences but is *more likely* to be produced by an internal cause

(9) In dermatoses of the hands and upper extremities in persons engaged in manual labour think first of occupational dermatitis. Enquire into the *exact* nature of the employment Do not be misled by the statement that a man works in a chemical factory He may be a lorry driver and never touch an irritant

(10) Unless you are satisfied that a dermatosis is of external origin examine the urine You may be rewarded by finding glycosuria

(11) Never forget the possibility of syphilis especially when what appears to be a common type of eruption occurs in an unusual position. Remember Hutchinson s dictum "Syphilis is the great imitator Do not be misled by the fact that a luetic eruption may sometimes itch

(12) A lesion on the penis may be herpes or scabies but do not forg t syphilis and spare no effort to confirm or to exclude venereal disease

(13) Whenever confronted by an eruption of urticarial type or resemb ling scarlatina or measles or even generalised eczema enquire carefully as to whether the patient has recently been taking drugs Many of the more recently introduced remedies cause skin eruptions

(14) In every case of an itching eruption no matter what is the social condition of the patient think first of scabies the itch

(15) Scabies and other parasitic diseases are likely to affect more than one member of the family

(16) Do not forget that pediculi capitis may be the cause of pus coccal infections about the head and neck in children and females of any class Pediculi *frequently account for chronic enlargement of the cervical glands* in children

(17) A bullous eruption in children is far more likely to be a bullous *urticaria* than dermatitis herpetiformis or pemphigus

Common diseases most commonly occur

(18) Think first of fungous infection in any case of an irritating or vesicular dermatosis affecting the feet and toes An itching vesicular

are dark brown or nearly black. The palms and soles are rarely scaly but the epidermis is obviously thickened the normal fissures are exaggerated and on palpation the surface is smooth and leathery

After scarlatinal desquamation the xerodermatous skin may become normal temporarily but the hyperkeratosis soon recurs

Except in the flexures the skin is always dry and perspiration is imperceptible In the hot weather there is an amelioration of the condition, doubtless because there is some sweating When sweat glands are absent (ectodermal defect) the subjects suffer much discomfort in the hot weather and they are ill adapted for tropical climates Itching is sometimes a troublesome feature



Fig 4 Ichthyosis.

Ichthyosis and xeroderma appear in the first year and increase in severity as a rule from the fifth to the fifteenth year and then remain stationary persisting throughout life The ichthyotic skin is peculiarly vulnerable Chapping quickly follows exposure to chill or easterly winds and mild degrees of irritation frequently produce eczema. The roughness of the skin causes the adhesion of particles of dust and dirt, especially on the lower limbs of young children, and the mother often complains that it is impossible to keep the parts clean Ichthyosis is a serious disadvantage in renal disease, as the measures adopted to induce diaphoresis are of little effect

Diagnosis. The history of a rough skin over the greater part of the body dating from soon after birth makes the diagnosis in a well developed case easy but there are slight degrees of xeroderma which may be easily overlooked. The history of repeated attacks of dermatitis or eczema occurring in the cold weather should lead to a careful examination of the whole surface The xerodermatous skin is not inflammatory and on removing the scales the subjacent skin is found to be normal in appearance Ichthyosis hystrix is a localised condition, the rough skin being in lines or sheets (vide p 37)

scaliness to one in which the scaling fully merits the term ichthyosis. The furrows are more distinct than in the normal epidermis and there may be some roughness resembling goose flesh from keratosis or prominence of the hair follicles particularly on the limbs (keratosis pilaris). In more marked cases there are branny scales of a dirty brown colour most developed on the extensor surfaces of the limbs. The face is dry and rough and radiating cracks are often seen about the orifices. Although



Fig 3 Ichthyosis

this form may affect the whole of the epidermis the skin of the flexures axillæ front of the elbows popliteal spaces and groins is often smooth and supple. The scalp is usually covered with a fine branny scurf. Anomalous distributions of the ichthyosis are not uncommon and the face palms and soles may be quite unaffected.

In the severe forms of ichthyosis there are scales of various sizes diamond shaped or polygonal resembling fish scales. The squamæ may be thin or thick, and in the worst cases the condition is greatly disfiguring. The hair in such instances is thin and scanty. Sometimes the scales

Keratolysis is a very rare condition in which the whole epidermis is shed at intervals, sometimes yearly very much in the way the snake sheds its skin.

Ichthyosis Hystrix or Linear Nævus. (Nævus unius lateris)

(Lat *hystrix* hedgehog)

Linear nævus is the name given to congenital lines or streaks composed of warty elevations covered with scales The localisation of the lesions and their usually limited character demand that these anomalies should be classed as nævi

Etiology The cause is unknown.

Pathology The unilateral arrangement of the bands and streaks,—which, however is not essential as there is a group of cases in which the lesions are bilateral, although not symmetrical,—suggests that the affection is of nervous origin but in many cases the lesions do not follow the lines or areas of nerves. Some suggest that Voigt s lines are the determining factor but the streaks are often quite irregular The individual lesions consist of thickening of the prickle layer and hyperkeratosis, with hypertrophy of the papillary layer A marked feature of the mass of hyperkeratosis is the persistence of nucleated cells. The elastic tissue is atrophic and there is often evidence of inflammation in the true skin Dilatation of the sweat ducts may occur

Clinical features. The condition may be noticed at birth, but often does not attract attention until the child is a few years old The area



FIG 5 Ichthyosis hystrix "linear nævus in an African.

involved may gradually increase for some years and it is wise to warn the child s parents of this tendency The lesions may be insignificant streaks an inch or so long or bands of irregular width extending the whole length

Varieties of ichthyosis. In the lamellar type the infant is covered in a thin shining layer resembling varnish and after several peelings the skin may become normal. In the variety which begins at or soon after birth with erythema thickening and scaling develop (*congenital ichthyosiform erythrodermia of Brocq*) (p 276) A severe form ichthyosis fœtalis will be described later Degrees of scaling and redness and age at onset are the distinguishing features of these types

Prognosis. The disease persists through life It is worse in the second decade and tends to become stationary and even less severe in adult life Treatment affords great relief but the condition is incurable

Treatment is purely palliative Thyroid extract administered internally will sometimes improve the condition but as the effect is transitory this treatment should be reserved for troublesome phases such as occur in cold dry weather Large doses of vitamin A administered parenterally often give relief and suggest that the underlying cause may be a congenital inability to utilise the vitamin Constant local treatment is important Bathing is useful to remove the scales The ordinary warm bath or baths with one drachm of liquor picis carbonis to the gallon may be given Frequent washing aggravates xerodermia by removing fat from the skin A superfatted soap should be used In the mild cases rubbing the whole surface once daily with equal parts of glycerine and water is all that is necessary to keep down the scaliness and impart smoothness and suppleness to the skin In the more severe forms oily preparations are to be preferred Equal parts of olive oil and lanoline rubbed in after a daily bath cleared off all the scales in the case represented in Fig 4 Natural fats alone are quickly absorbed by the skin and it is very advantageous to dilute these with sufficient liquid paraffin or vaseline to maintain suppleness Constant attention is required or relapses will occur To prevent chapping washing with warm water and above all careful drying are required The eczematous lesions may respond to the usual zinc and tar paste but if weeping is slight or absent emollient ointments and liniments are better being more greasy than paste

The following preparations have been found useful —

℞ Ol olivæ	℞ Glycerin 1 oz
Aq calcis āā 2 parts	Tr benzoin m 24
Lanolin	Pulv tragacanth gr 30
Paraffin molle āā 3 parts	Pulv ac boric gr 60
Ft cremor	Aq rosemari to 6 oz
	Ft lotio

Ichthyosis Fœtalis Harlequin Fœtus

Harlequin fœtus is usually described as a form of ichthyosis but on very unsatisfactory grounds It is a rare condition occurring in the infant The skin is tough and like parchment, with large deep cracks or furrows forming plates The lips and eyelids are stiff and the child is unable to suck Death occurs a few days after birth In some instances the infant is stillborn There is a milder degree of this affection in which the scales are thin and ultimately peel off leaving a normal smooth surface By some the latter form is believed to be the persistence of the epitrichial layer which should be shed by the fœtus at the seventh month.

to be preferred and they should be excised or destroyed by diathermy the Paquelin or electric cautery or by radium or solid carbonic acid.

No doubt excision followed if necessary by skin grafting gives the best cosmetic result but keloid is apt to develop in the scar

Acneiform Nævus

A girl seen at the London hospital clinic was the subject of a remarkable congenital anomaly which affected the sebaceous gland mainly on the left half of the body neck axilla and upper arm (Fig 0). The face was also involved. In this type of nævus the lesions which are congenital are of the comedo-type depressed cavities from a pin head to a millet seed in size filled with black greasy material which can be expressed They may atrophy leaving pitted scars Comedones acneiform lesions and scars have been reported in other cases of nævus unilateris

Tylosis (Keratodermia palmaris et plantaris)

Tylosis is an hereditary and familial hyperkeratosis of the palms and soles

Etiology Several members of a family may be affected and the

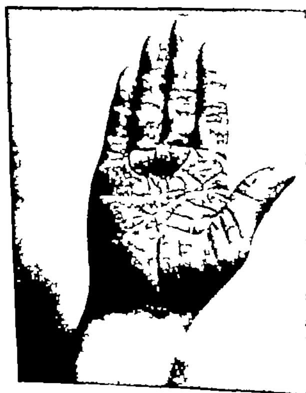


Fig. 7 Tylosis. The left palm was similarly affected. The affection was known to have occurred in four generations.

of a limb or round the trunk often with a segmental distribution As a rule the streaks or bands are unilateral hence the name nævus unius lateris Each streak is composed of closely set small warty swellings covered with scales It may be almost the colour of the surrounding skin or brownish or blackish in tint In a case seen recently a linear streak of reddish papules extended from the right internal malleolus to the right labium majus and was mistaken for lichen planus In another a jet black macular streak ran down the mid line of the abdomen stopping sharply at the linea alba as though drawn with ruler and pen Ormsby pictures a warty variety of similar distribution Fig 5 depicts an exaggerated condition in an African Occasionally squamous-celled carcinoma may develop in later life upon such nævi Rarely the nævoid condition may involve the soft palate as well as the skin of the face

In the rare condition known as Ichthyosis hystrix gravior (Porcupine skin disease) there is an extraordinary development of warty masses



Fig 6 Nævus unius lateris. Acneiform lesions with many comedones.

involving a large part but never the whole of the integument In one family this affected the males for four generations

Bullæ are sometimes a rare feature of ichthyosis

Treatment. Unless giving trouble by their position the linear nævi may be left alone Caustics will thin them down but radical treatment is



FIG. 8. Honeycomb naevus.

and Savatard found some benefit from thorium X but does not recommend it and no treatment is likely to have much effect.

REFERENCE.—L. SAVATARD 1918, *Brit Jour Derm. and Syph.* 35, 11 Figures and Literature.

Porokeratosis (Mibelli and Respighi) (Gk. *poros* pore; *keras*, horn) A chronic spreading hyperkeratosis affecting the palms, soles, extensor surfaces of the hands and feet, the adjacent parts of the limbs, and rarely other parts, including the buccal mucosa. The lesions are usually symmetrical (Fig 9)

Etiology The cause is unknown Males are more commonly affected than females. The disease appears in childhood, and Gilchrist recorded eleven cases in four generations of one family Reviewing the reported cases Cockayne finds fourteen families in which more than one generation was affected and in these were ninety cases of porokeratosis.

Pathology The horny layer of the epidermis and the upper part of the

condition has been known to occur through four or five generations The Maladie de Meleda ' occurring in an island off Dalmatia is an endemic and hereditary affection of this type

Pathology The condition is a hyperkeratosis

Clinical features The palms and soles are symmetrically affected, being covered with thick horny yellowish plates with well-defined margins The normal fissures are exaggerated. In some cases the skin is darker often brown or nearly black the fissures producing a mosaic like appearance or a rough surface resembling the bark of a tree The movement of the parts is impeded and the fissures are often painful In one case under Sequeira s care a squamous cancer developed on a tylosis

Occasionally tylosis is associated with extensive ichthyosis hystrix. This association was present in two children in one family attending the London Hospital clinic The father also suffered from tylosis In another child whose family had been free from cutaneous anomalies the tylosis and ichthyosis hystrix were associated with bullous lesions of the type known as epidermolysis bullosa Although associated defects are rare a considerable variety have been reported including mental defects abnormalities of the hair and nails hypogenitalism and multiple lipomata

The disease is generally noticed when the subject is about four or five years of age and persists through life Amelioration is sometimes seen in the summer

Treatment is palliative only The thickened epidermis may be softened by plasters of salicylic acid or by the application of lotions of the same drug We do not advise treatment by X rays A temporary improvement may follow their use but repetition leads to cicatricial atrophy with telangiectases and grave risk of carcinoma

Keratodermia punctata. This is probably a nævoid keratodermia arising at any age in either sex characterised by diffuse and circumscribed hyperkeratoses somewhat resembling the keratoses seen in chronic arsenical poisoning The warty lesions may fall out to leave small pits in the skin

Honeycomb atrophy (Folliculitis ulerythematosa reticulata atrophodermia reticulata symmetrica) This is a rare sometimes familial congenital anomaly characterised by a reticular atrophy on both cheeks It is usually first noticed as an erythema with comedones and horny follicular plugs between the ages of five and ten years In some cases there has been extension on to the forehead It runs a slow course and in adult life tends to improve slowly The reticular character of the atrophy is a special feature (Fig 8 p 41) It has been seen associated with lichen spinulosus folliculitis decalvans and with epidermal cysts

The condition may be mistaken for the results of acne vulgaris but papules and pustules and seborrhœa do not occur as a primary cause

Histologically the hair follicles are found to be distorted acanthotic and hyperkeratotic Horn cysts derived from the hair follicles are found in the dermis The sebaceous glands are undeveloped The atrophy is due to degeneration of collagen

Treatment It is probably best to leave the condition alone as it tends though slowly to improve Small doses of X rays have been employed

trauma Healing may be delayed or the lesions may persist and appear as indolent pyogenic granulomata

Rarely the eruption arises in adult life

Etiology The disease sometimes runs in families for generations and several members of the same family may be affected In other cases heredity cannot be traced

Pathology Nothing definite is known as to the cause Elliot and others have found in the apparently normal skin of subjects of epidermolysis degeneration changes in the basal epithelial cells The bullæ are formed by the exudation of serum and occasionally blood and by some authors an embryonic condition in the vessels is believed to be the essential feature

Clinical features. The disease appears in infancy and may persist to adult life Very rarely the anomaly is present at birth. The parent notice that slight friction and pressure which normally would have no effect on the skin, produce blisters The parts most exposed to trauma or



FIG. 10 Epidermolysis bullosa. Blebs and atrophic skin bout the knees.

pressure viz. the knees ankles feet elbows wrists and knuckles, are consequently affected. The mucous membranes may also be involved. The blebs appear with great rapidity and vary in size from a pea to half a walnut or larger Most of them contain serous fluid but blisters containing blood are not uncommon. The bullæ on rupture dry up quickly and there may be some atrophy of the skin with reddish purple discoloration at first and such smooth, shiny patches on the elbows and knees may be mistaken for psoriasis In these discoloured atrophic patches white pin head-sized shining spots form and these on microscopical examination are found to be epidermal cysts. Such cysts formerly miscalled "milia" occur after other bullous eruptions but in this form of epidermolysis bullosa they are more numerous than in any other condition (Figs. 11 and 12)

The finger and toe nails are atrophic and in some instances consist merely of small horny pegs In others the nails are yellowish or dirty brown and opaque and do not reach the ends of the digits

In none of our cases has there been any eosinophilia or other noteworthy blood change

rete are affected. There is considerable increase of these layers (hyperkeratosis) and the sweat glands of the skin are involved in the process, hence the name Porokeratosis.

Clinical features. The eruption begins with a number of warty papules on the extremities, but occasionally the face and the genital organs are affected. The papule is conical with a crater-like depression in which is a horny plug. The papules slowly *increase to form irregular circinate spots* or plaques of variable size and shape. The plaque may be only half an inch in diameter, or it may involve the whole of the affected limb. The *early patches are circular*, but the older ones have an irregular outline. The edge in the fully-developed plaque is well defined, consisting of a row of papules which may be at the bottom of a furrow or groove, presenting a narrow corneous seam. The centre of the area may be atrophic or scaly,

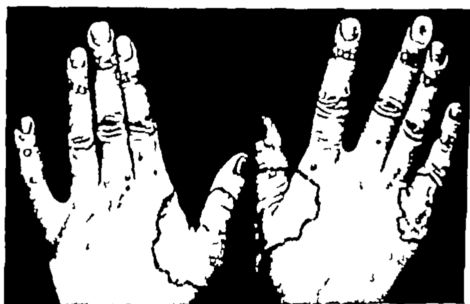


Fig. 9.—Porokeratosis (Mibelli). Photograph kindly lent by Sir James Galloway.

but it is sometimes of normal appearance. *Occasionally papular or ringed lesions reappear on the central area.* The nail may be involved, an opaque area forming by extension from a finger lesion. The buccal mucosa and palate may be affected and here the rim resembles a *fine silk thread*. The disease begins in childhood and progresses slowly for years.

Treatment. Patches of limited area have been successfully treated by electrolysis. Ingram found Grenz rays effective (dosage 800 r.).

Epidermolysis bullosa

(Gk. *luo*, break up)

The simple condition, which was formerly called congenital traumatic pemphigus, is a *developmental anomaly in which slight traumatism causes the formation of bullæ*.

Other rarer varieties, dominant or recessive types, have been described as anomalous dystrophies in which *bullæ appear without preceding*

trauma Healing may be delayed or the lesions may persist and appear as indolent pyogenic granulomata.

Rarely the eruption arises in adult life

Etiology The disease sometimes runs in families for generations and several members of the same family may be affected. In other cases heredity cannot be traced

Pathology Nothing definite is known as to the cause Elliot and others have found in the apparently normal skin of subjects of epidermolysis degeneration changes in the basal epithelial cells The bullæ are formed by the exudation of serum, and occasionally blood and by some authors an embryonic condition in the vessels is believed to be the essential feature

Clinical features. The disease appears in infancy and may persist to adult life Very rarely the anomaly is present at birth The parents notice that slight friction and pressure which normally would have no effect on the skin produce blisters The parts most exposed to trauma or



FIG 10. Epidermolysis bullosa. Blebs and atrophic skin about the knees.

pressure viz. the knees, ankles feet elbows, wrists and knuckles, are consequently affected. The mucous membranes may also be involved The blebs appear with great rapidity and vary in size from a pea to half a walnut or larger Most of them contain serous fluid but blisters containing blood are not uncommon The bullæ on rupture dry up quickly and there may be some atrophy of the skin with reddish purple discoloration at first and such smooth shiny patches on the elbows and knees may be mistaken for psoriasis In these discoloured atrophic patches white pin head sized shining spots form and these on microscopical examination are found to be epidermal cysts. Such cysts formerly miscalled "milia," occur after other bullous eruptions but in this form of epidermolysis bullosa they are more numerous than in any other condition (Figs 11 and 12)

The finger and toe nails are atrophic and in some instances consist merely of small horny pegs In others the nails are yellowish or dirty brown and opaque and do not reach the ends of the digits.

In none of our cases has there been any eosinophilia or other noteworthy blood change.

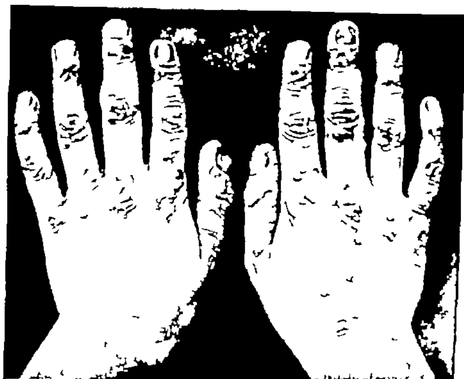


FIG 11 Epidermolysis bullosa. Atrophic nails and epidermal cysts in sites of old bullæ

The **prognosis** is usually bad. We have seen improvement at the approach of adolescence but in severe cases the patient is crippled for life



FIG 12. Epidermal cysts from case of epidermolysis bullosa. *Micro-photograph of section.*

every kind of work being impossible on account of the formation of blisters on slight provocation

Treatment is purely palliative Drugs have no influence on the disease and all that can be done is to protect the parts and apply soothing ointments to the blisters on rupture

CONGENITAL PIGMENTARY ANOMALIES

The pigment of the skin may be congenitally absent as in albinism or in excess, as in pigmented moles

Albinism

A congenital absence of the pigment of the skin, hair and choroid. Albinism is more common in the tropics than in temperate zones and consanguinity and hereditary transmission have been recorded. It is held to be caused by a single recessive gene It may be associated with mental defect

Albinism is usually complete Total absence of pigment is exceedingly rare. The skin of the albino is white or pale pink, the hair is very fine and of a white or pale yellow colour The iris is commonly pink and the pupil shows the red reflection from the non pigmented choroid. In the negro the red reflex is less evident than in white subjects. Photophobia and nystagmus are constant symptoms

The albino in the tropics suffers severely from solar dermatitis on exposed parts Lichenisation is common and sepsis is a frequent complication Squamous carcinoma may develop on the face and exposed parts (Fig 141 depicts a rapidly growing cancer in an albino African woman.)

Partial albinism produces a "piebald" appearance. It may be inherited. It may take the form of a white "blaze" on the forehead or white streaks down the back, chest or abdomen. It is seen rarely on the glans penis

Histologically the only change in albinism is the absence of melanin.

Prognosis. Albinism is incurable. Relief to the patient may be given by the application of emollients containing 1 per cent. of sulphate of quinine Dark glasses should be worn to protect the eyes.

Mongolian Blue Spots

A congenital condition characterised by dark bluish spots on the lower sacral region and elsewhere

This anomaly probably an atavistic phenomenon, being vestigial mesodermal pigmentation which is predominant in animals, occurs in the majority of newly-born babies of the Mongolian race but is relatively rare in white persons Bloch, however stated that the deposits can always be found in the corium at birth.

The spots are rounded or oval from one-fifth of an inch to five inches in diameter They are well defined or shade into the colour of the surrounding kin. The surface is normal and the colour does not disappear on pressure There may be one macule or several. The sacral region and

buttocks are most commonly affected but the spots may occur elsewhere. The spots are present at birth and usually disappear by the *fourth year*.



FIG. 13. Mongolian blue spot in Chinese infant in mid line above gluteal cleft. *The other swelling is a cavernous nævus.*

Histologically the blue spot is found to be due to fusiform cells containing melanotic granules in the corium. The cells are large and branched and give a positive "dopa" reaction.

No treatment is necessary.

Urticaria pigmentosa

A rare affection characterised by the formation of macules (Lat. *urtica*, nettle) papules or nodules which may become urticarial when rubbed.

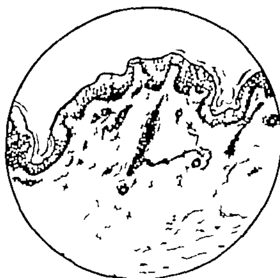


FIG. 14. Urticaria pigmentosa (× 75) showing infiltration of mast-cells along the vessels.

Etiology The disease usually begins in early infancy in more than 70 per cent. during the first year of life Males are twice as frequently affected as females There is no evidence of heredity but occasionally two members of a family may be affected. The cause is unknown, and the eruption is compatible with perfect general health. Cases of similar type occurring in adults have been put on record, but there is some doubt whether the disease is the same

Pathology There is in the corium especially about the vessels infiltration composed entirely of mast cells which are stellate and with Pappenheim's stain show a pale-blue nucleus and deep-red granules in the cytoplasm. The infiltration is placed superficially and there is some increased pigment in the basal cell of the epidermis. In one rare type cells which stain similarly but are rounded and not stellate, are situated deeply in the corium and hypoderm and there is no increased pigmentation. A few mast cells are seen in normal skin and in chronic inflammatory infiltrates.



FIG. 15 Urticaria pigmentosa.

Clinical features. The eruption begins with urticaria, papules or red macules usually during the first year of life sometimes soon after or rarely at birth, though exceptionally it may not develop until after puberty Recurrent attacks of urticaria, in which the lesions appear in the same sites, continue and at last the characteristic macules are formed. These lesions are persistent and are usually scattered thickly over the whole of the surface or limited to certain areas In rare cases the macules are very few in number There are two types of eruption, macules and nodules and in some cases both forms are present The macular cases are by far the more common (Plate 1 Fig 15) The spots are pigmented patches varying in size of a buff to a brown colour which on exposure to the air or on slight friction become turgid and wheal like. It is usually easy to provoke factitious urticaria over the macules by stroking the skin. There is often itching but this is not constant, and rarely severe The neck and the trunk are more affected than the limbs and scalp but no part of the body is exempt.

In the rare type the lesions are nodules of a yellow colour closely resembling the tumours of *congenital xanthoma* but differing from them in the presence of urticaria and of itching The pigmented spots and nodules persist for years but often about puberty they begin to clear up and ultimately disappear It is interesting to note that the lymphatic glands may be generally enlarged more than can be accounted for by the scratching of the patient

Urticaria pigmentosa in adults The similar eruption which occurs in adults is characterised by *mildness or absence of the urticarial lesions* The eruption is macular and the individual spots are of small size Mast cells may be absent

Diagnosis Urticaria pigmentosa is often mistaken for secondary syphilis in adults We have known cases in which repeated serological tests have been made

Prognosis Treatment is of little avail and one can only hope for the disappearance of the eruption at puberty

Treatment. The itching may be relieved by the measures recommended for urticaria Dr Radcliffe Crocker advocated small doses of arsenic internally but there is rarely much benefit from any form of internal treatment Any gastro-intestinal derangement should receive attention

Nævus pigmentosus (Pigmented Mole)

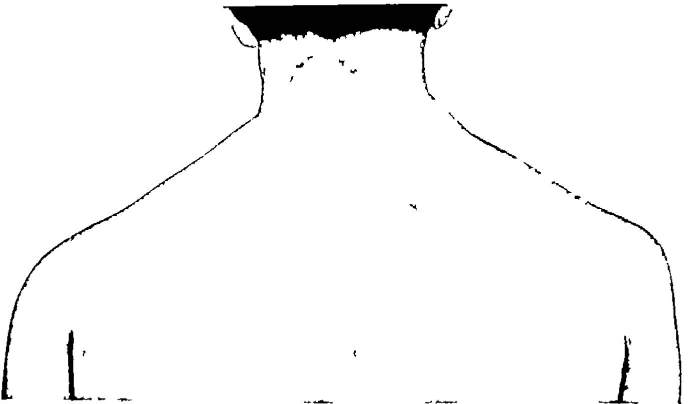
The etiology of pigmented moles is unknown Maternal impressions are often invoked as causes Some believe that racial intermixture is a factor

Pathology Sections show a collection of regularly arranged columns and nests of cells resembling epidermal cells in the corium. The corium being a mesoblastic structure it would appear that the epiblastic cells are abnormally included in it in the process of development According to Dawson invasion of the corium by epidermal cells occurs much later He claims that histological studies have shown *the proliferation of cells* spindle shaped or branching and containing pigment in the deeper layers of the epidermis and rete pegs Prickles are lost and widening of inter cellular spaces permits the extension of connective tissue from the corium thus isolating groups of epidermal cells amongst which are the branched pigmented cells The extent and colour of the resulting nævus depends upon the atrophy quiescence or proliferation of these cells Masson *maintains* that these nævoid cells are of nerve origin Hypertrophy of the hair follicles is common

Clinical features Pigmented moles may be present at birth and occur on any part of the body They may be single or multiple and *of all sizes from a pin s head to large tracts covering one-half of the head or extensive areas of the trunk and limbs* The mole is a circumscribed spot or patch of brownish or brownish black skin usually covered with hair The hairs may be fine and downy or strong and stiff The surface of the mole may be smooth or irregular and warty especially if there be also hypertrophy of other elements of the skin

Prognosis. Except for the disfigurement the pigmented moles are of

PLATE I



URTICARIA PIGMENTOSA. Boy aged one. Showing widely spread pigment spots. They extended up to the scalp.



Fig. 16. Pigmented mole, which ultimately became covered with long hair

little significance until middle life is reached. There is however a risk of their becoming malignant in later adult life but this risk is undoubtedly



Fig. 17 Pigmented hairy mole. [illegible]



Fig. 18. After excision and skin graft.

small because pigmented moles are very common and melanotic carcinomata arising in such nævi are relatively rare. When such malignant *development occurs rapid metastases are to be expected*.

Treatment. Removal may be demanded on account of the disfigurement. Small pigmented nævi may be destroyed by electrolysis or by diathermy. Painting with trichloracetic acid removes pigmentation and may flatten the mole. The hairs can be removed by electrolysis and after their removal there is often some diminution of the pigment. It is thought by some authorities that treatment with electrolysis or irradiation increases the risk of malignant change, but we agree with MacKee that no evidence has been produced to support this view.



FIG. 19. Later stage of Fig. 18.

Moles may be excised and if the area is of considerable size plastic surgery will give the best cosmetic result.

Solid carbon dioxide is also of service in the treatment of extensive pigmented moles being pressed firmly on the area for forty seconds. A moderately severe reaction with the formation of bullæ results, the hair comes out and the pigmentation fades. Several sittings may be necessary. Thorium X is also of value in the treatment of pale moles (see p. 770). In very dark moles it is impossible



FIG. 20. Nævus verrucosus.

PLATE 2



AN EXTENSIVE VASCULAR NAEVUS WITH MANY ERECTILE TUMOURS

The mucous membrane of the lips and tongue were also involved

[To face p. 41]

to remove all the colour and they should be excised or left alone

In the adult any pigmented mole which is increasing in size should be removed without delay and if the biopsy suggests malignancy an extensive resection of lymphatic channels and glands should be undertaken



FIG. 21 Nævo-lipoma.

Nævus verrucosus is the name given to a pigmented mole with hyperkeratosis (Fig 20).

Nævus lipomatodes is a pigmented mole with hypertrophy of the connective tissue and fat (Fig 21).

Milium congenitale is a rare congenital condition. Dr Radcliffe Crocker described two cases.

The lesion is a pale reddish yellow plaque on the head or face The surface is finely granular and composed of closely aggregated pale yellow papules the size of a pin s point. Comedones are present at the borders and scales on the surface Patches on the scalp are hairless. These nævoid structures consist of nucleated epithelial cells in the corium enclosed in a kind of capsule

The treatment of these nævi, if limited, is on the same lines as for the common pigmented mole.

REFERENCES—J W DAWSON, "The Melanomata, *Edi Med. Jour.*, 1925, 501 W A. EVANS and T LEUCUTIA. Treatment of Melanotic Tumours of the Skin," *Amer Journ. Roentgenol.*, 1931 xxvi, 236. P MASSON *Ann. d'anat. path.*, 1926, 3, 417

CONGENITAL ANOMALIES OF THE CUTANEOUS VESSELS

Nævus anæmicus. This name is given to a condition in which there are one or more scattered patches of skin which are paler than the normal integument. These may be caused by an impaired development of the cutaneous vessels or of their nerve supply The flare reaction of Lewis is smaller in the anæmic areas than in the normal skin and disappears very slowly

This phenomenon led to experiments by F O Piorkowski who produced in a normal skin the characters and reactions of nævus anæmicus by the ionto-phoresis of 1 in 1,000 solution of epinephrin hydrochloride. He concludes that this congenital anomaly is a fault of innervation. (1944) *Archiv of Derm. Chicago* 50, 874. Bibliography Parkes Weber described a group of cases in which the anæmic nævus was associated with extensive telangiectatic nævi meningeal hæmangioma, buphthalmos and nervous phenomena suggesting a relationship with von Recklinghausen's disease. (1932) *Brit J Derm and Syph.* 44, 77

Nævus vascularis

The vessels of the skin and the subcutaneous tissue may be congenitally hypertrophied forming the local or diffuse vascular overgrowths called

nævi vasculares They are the commonest congenital affections of the skin and it has been estimated that one person in ten has a vascular nævus of some sort When the term "nævus is used without a descriptive adjective this form of congenital anomaly is usually implied

Vascular nævi may be classified according to the parts involved as cutaneous subcutaneous and mixed They may be subdivided into the *following groups* —

(1) Capillary hæmangioma
- (*a*) Simple superficial type } Angioma simplex.
- (*b*) Port wine mark (nævus flammeus) } Angioma simplex.
- (*c*) Stellate type (nævus araneus)

(2) Cavernous hæmangioma
- (*a*) Superficial strawberry mark. Cutaneous nævus
- (*b*) Deep or subcutaneous

(3) Mixed type Capillary cavernous hæmangioma

Etiology The plane angioma (nævus flammeus) and angioma cavernosum are congenital anomalies though they may escape notice until



FIG 22 Nævus flammeus.

some time after birth The spider or stellate nævus does not usually appear until some years after birth and sometimes follows an injury It should perhaps be considered as a form of telangiectasis but for convenience is dealt with here

Pathology "*Nævus flammeus the plane angioma* or port wine mark is a capillary hyperplasia The vessels are dilated but there are no lateral communications between them Though it is a capillary telangiectasis it often extends through the whole depth of the skin The *cavernous nævus* is a hypertrophy and dilatation of the capillaries of the corium or of the subcutaneous tissue or of both with communications between the dilated

vessels forming cavernous spaces The subcutaneous nævus may be enclosed in a fibrous envelope or it may be diffuse Combinations of subcutaneous tissue and fat overgrowth with the vascular hyperplasia occur Congenital vascular nævi are often associated with other congenital affections such as adenoma sebaceum pigmented moles fibromata etc The *nævus araneus* (Lat *aranea* spider) consists of a central arteriole with radiating large capillaries extending from it.

Clinical Features :—

Angioma Simplex. The lesions are macules of a pale pink colour or bright red purple or violet (*nævus flammeus* port wine mark). They are usually of considerable size and may affect large tracts of skin They are often unilateral involving perhaps one-half of the face and neck or forming extensive bands along a limb or on the trunk Occasionally lesions of small size occur in the neighbourhood of an extensive patch. The macules are of varying shape and the surface may be perfectly smooth, or there may be small erectile tumours on a flat area (Plate 2) The colour varies from time to time effort, crying coughing and exposure to cold tending to deepen the tint. Pressure causes a temporary disappearance or diminution of the colour In some cases the vascular dilatation occurs in the mucous membranes as well as on the skin The face and neck are the parts most affected, and the condition causes great disfigurement. A slight nævoid condition of the median part of the forehead and nape is common the latter is sometimes called *erythema nuchæ*

Cutaneous nævus. The common strawberry mark is generally smaller than the port wine stain. It varies from a pin s head to an inch or so in diameter It is elevated above the surface of the surrounding skin and is of a bright red colour Compression causes partial or complete disappearance of the colour and swelling Effort, crying coughing and the like tend to cause erection or turgescence of the tumours This type of nævus may occur anywhere on the skin and occasionally on the mucous membranes.

Subcutaneous nævus. The skin over the swelling is of normal colour or bluish, but compression causes the nævus to diminish in size though it rarely completely disappears Sometimes it has the distensible character of the common cutaneous variety

Mixed nævi are more common than the purely subcutaneous. The swelling is in part red, but the affection of the vessels of the skin is rarely so extensive as that of the subcutaneous tissue Large mixed nævi are sometimes met with at the muco-cutaneous junctions of the mouth and of the external genitals.

Fibro-angioma (Gk. *aggeion*, vessel). In rare instances a vascular nævus of large size may be associated with a hyperplasia of fibrous tissue.

Course Vascular nævi may (1) disappear spontaneously (2) remain stationary or simply increase with the growth of the child, or (3) grow rapidly Authors often lay stress upon the frequency of spontaneous disappearance and supporting this view is the fact that the pink varieties and the subcutaneous nævi are extremely rare in adults yet common in children, and surely some must escape treatment (*vide* W A Lister, 1938 *Lancet*, i., 1429) The deeper port wine marks and vascular nodules certainly persist, often unfortunately in spite of treatment.

Injury or friction may cause ulceration of the nævus especially if it is situated on the genitals in the groins or on mucous surfaces The ulceration may involve the whole or part of the angioma and as a rule cures it by the *formation of a scar* *Healing in such cases is slow*

Familial telangiectasia (Gk *tele* far *aggeion* vessel) is characterised by recurring epistaxis and multiple telangiectases of the skin and mucous membranes Osler has specially drawn attention to this group and the clinical features are thus summarised in a paper of Parkes Weber The disease affects and is transmitted by both sexes The hæmorrhage is in most cases only from the mucous membrane of the nose and the epistaxis usually precedes the cutaneous manifestations by many years The telangiectases first attract attention towards middle life and the tendency to *hæmorrhages and to the formation of angiomata increases with age* Grave anæmia may result There is no tendency to hæmophilia and no alteration in the coagulability of the blood The telangiectases affect the face lips ears and buccal and nasal cavity chiefly but the trunk and extremities may be involved and rectal hæmorrhages and menorrhagia have been recorded Colcott Fox s case was characterised by bilateral telangiectases on the trunk with a marked history of epistaxis in childhood *and recent rectal hæmorrhage There was no family affection In a* woman under our care the telangiectases began at the age of forty-one Her brother and one sister and her paternal aunt suffered from epistaxis which in two cases had necessitated plugging of the posterior nares

Hutchinson s ' Infective Angioma. Angioma Serpiginosum. A peculiar form of vascular nævus characterised by red patches some of which have a purplish tint round which are clusters of minute red spots—the cayenne pepper grains of Hutchinson *In a girl of twenty under* Sequeira s care it was stated that a few scattered red spots were noticed when the patient was two years old The nævus had gradually spread by the formation of minute red spots until it reached from the right shoulder and part of the neck and chest down the arm and forearm as far as the dorsal surface of the forefinger and thumb This form of angioma differs from those previously described in its slow extension

Nævus araneus. Stellate nævus Spider nævus

This common variety demands special notice The lesions consist of small bright red spots varying in size from a pin s head to a millet seed and from this as a centre thread like dilated capillaries radiate Occasionally the central spot is erectile Although it may be visible at or soon after birth the stellate nævus sometimes does not appear until the second decade of life or even later It is possible that all are derived from small congenital lesions but their sudden appearance may be *related to trauma* or toxæmia In any case most of these nævi do not attract attention till the child is in its teens They are commonly multiple and usually on the face

Diagnosis Sometimes an early lupus vulgaris is mistaken for a vascular nævus The colour of the jelly like nodules and the *date of their* appearance should prevent this error An ulcerated nævus is likely to give rise to real *difficulty* The *history* that there has been some abnormality noticed at birth or soon after and that recently this has taken on an ulcerative character will be a guide Moreover the ulceration is

often incomplete, and some portion of the lesion will show the true nævoid character but fungating malignant disease may be simulated.

Prognosis. Nævi may disappear spontaneously particularly the superficial variety which affects the forehead and nape of the neck and most of the cavernous nævi. Others remain stationary and some increase rapidly.

Treatment. Nævi require treatment when they are increasing in size when they cause disfigurement and when they are ulcerated. Remembering that they may disappear spontaneously many advise waiting in all cases where the nævus is not obviously growing to allow time for this spontaneous involution. While waiting it is a good plan to paint the nævus daily with non-flexile collodion, which exerts a steady pressure on the vessels and occasionally appears to effect a cure.

Unless rapidly increasing there is rarely any necessity for treating a nævus on covered parts of the body. On exposed parts and especially on the face and neck, it is of the utmost importance to effect the removal with the least possible disfigurement.

Both physiotherapy and, occasionally surgery are employed in the treatment of vascular nævi. The method chosen will depend upon the site of the angioma, its size whether it is capillary or cavernous and whether it involves the subcutaneous tissue as well as the skin. Many measures have been used but we shall present here those that we have found of service.

Treatment of Naevus araneus ("Spider naevus"). *By electrolysis.* A current of 1 to 2 milliamperes is employed. The sterile iridio-platinum needle attached to the negative pole is inserted into the body of the nævus while a pad moistened with saline solution is placed upon some indifferent part. On the passage of the current the body of the angioma and its limbs become pale and then the needle is withdrawn. As a rule no anæsthetic is required except when the site is an eyelid. The scar is imperceptible (see p. 757).

By cautery. The centre of the nævus is touched momentarily with the point of a Paquelin or galvano-cautery at a dull red heat. A minute depressed scar is left.

By diathermy. A fine point is used similarly.

Treatment of capillary nævi. Small capillary nævi may be treated satisfactorily by the carbon dioxide pencil. It is wise to make a pencil with parallel sides a little larger than the area to be treated and to pare it down to fit exactly. The pencil is then pressed firmly upon the part for from twenty to forty seconds according to the effect desired. On the removal of the pencil a depressed white cavity with frozen edges is seen. In about five minutes the cavity fills up and becomes a deeper red. The actual application may be attended with little pain but the thawing process is sometimes very painful. In six hours or less there is a strong inflammatory reaction with the formation of blisters. These are allowed to heal under some simple soothing antiseptic dressing. Provided there is no encroachment on the surrounding skin and sepsis is avoided a supple scar results. The melting point of the CO_2 snow is $-79°$ C. (see p. 756).

Larger nævi can be treated by adding powdered CO_2 to acetone or alcohol to make a slush which is swiftly applied to the surface with a brush. Freezing is immediate and the effect can be increased by rapidly reapplying the slush to keep the part frozen. If the results are inappreciable and the

child stands pain badly Thorium X solution should be used as described for the treatment of nævus flammeus (*infra*)

Treatment of cavernous nævi As already mentioned many of these disappear spontaneously for they are rare in adults *It is therefore rarely* necessary to treat them unless they are growing or for cosmetic reasons *Such nævi on the trunk etc may be left alone* Cavernous nævi of the scalp should not be treated unless they are conspicuous as any measure employed may cause baldness Careful irradiation is probably the most satisfactory treatment

Gamma rays In our experience the best treatment is by gamma radiations from screened radium needles plaques or the radium bomb provided the dose is well under that which might cause atrophy of the skin X rays may also be used The exact dosage should be left to an experienced radio therapist

Radium needles or *radon seeds* may be imbedded in cavernous nævi and if the operation be skilfully performed there is little risk of damaging the overlying epidermis

Injections *Multiple injections of 1 minim of tr iodi mitis or of acid* hydrochloric dilut into the body of the cavernous nævus cause focal inflammation and thrombosis with subsequent shrinking and good results may be obtained

Electrolysis Excellent cosmetic results may be obtained in many cavernous nævi by bipolar electrolysis A current of from 5 to 10 milliamperes is used Both poles are connected with irido platinum needles and they are inserted into the nævus Bubbles of gas are evolved N B On no account should a *steel* needle be used at the positive pole because iron will be deposited in fact tattooing will take place When the nævus is of considerable size several punctures may be necessary or the multipolar apparatus of Lewis Jones may be employed After the operation the area is covered with sterile gauze fastened with collodion For the electrolysis of these nævi an anæsthetic is required especially if they are near the eye CO_2 snow should *not* be used on a deep cavernous nævus since it can only produce an elevated prominent scar over the deep unaffected portion

Treatment of nævus flammeus. The deep purple type is usually resistant *to all forms of therapy* *We have tried CO_2 snow electrolysis* intradermal injections multiple puncture with the cautery beta and gamma rays with radium and radon blister reactions with the Kromayer lamp and thorium X without good effect The majority of these birth marks are extensive and highly disfiguring Where treatment has proved unavailing Cover mark (Lydia O Leary New York) may be used to hide *them*

Thorium X The paler varieties especially when patchy can be much improved by painting with thorium X in a varnish or *in alcoholic solution* We prefer the latter and advise a solution containing 2 000 e s units of thorium X per c c The affected skin is cleansed with ether and the solution is painted on with a camel hair brush. As it dries a second and third coat may be applied and the surface blown upon to hasten drying A stronger reaction is obtained if an occlusive film of collodion is then applied The area should not be washed for at least four days and preferably for a week to obtain the maximum effect An erythematous

reaction appears in a few days and some desquamation later. Superficial vesication may be caused by several paintings. The reaction subsides in three to four weeks and the application should then be repeated. After twelve to eighteen treatments pale areas should be conspicuous and the treatment may be suspended to observe if the improvement is progressive.

Green ray therapy has given good results in some cases. A dose of 700 r is a safe initial dose and if the skin does not become sore this may be doubled and repeated after two weeks. The interval of two to four weeks is adjusted according to the reaction and the dose given. The surrounding skin must be protected by adhesive strapping or a bismuth paste. Severe reactions may lead to subsequent telangiectases.

None of the above methods can be deemed satisfactory but considerable improvement may be effected. In every case a guarded prognosis should be given (see Appendix III).

Erythema nuchæ. The usually pale pink birth-mark so common at the nape of the neck and extending up into the hair rarely demands treatment. Many disappear in time and others can be hidden by the hair.

Angio-keratoma. A rare condition characterised by minute telangiectases with warty growths upon the extremities.

The patients are usually females and all suffer from chilblains. The late Dr Pringle showed four cases in one family and similar instances of familial affection are on record. Some have suggested that the affection is a tuberculide, but of this there is no direct evidence.

Histologically the lesions consist of dilatations of the capillary blood vessels. The stratum corneum is thickened, and there is inflammatory thickening of the papillary layer. The horny thickening is secondary to the vascular dilatation.

The disease begins in childhood or adolescence in persons of poor physique. In most instances the telangiectases first appear as a sequel to chilblains.

The lesions are pin head sized vascular growths on the backs of the fingers and toes sometimes on the limbs rarely on the ears. The vascular growths become warty and by coalescence small horny vascular patches may form. The larger tumours bleed easily.

The lesions can be removed by electrolysis. The general health usually requires attention.

CONGENITAL AFFECTIONS OF THE LYMPHATIC VESSELS

Lymphangioma circumscriptum is a rare condition of overgrowth of lymphatic vessels and spaces in the skin. It may co-exist with a common vascular nevus. The lesions are multiple closely set transparent vesicles with thick walls. The tumours appear in infancy or early childhood, and the chest and upper limbs are the parts most commonly affected. There are no symptoms and there is no tendency to spontaneous involution as in some of the congenital angiomata.

A rare form of diffuse lymphangioma causing elephantiasis is described at p. 130.

Treatment. If causing trouble from their position, lymphangiomata may be removed by excision or destroyed by electrolysis carbon dioxide snow diathermy or radium.

child stands pain badly Thorium X solution should be used as described for the treatment of nævus flammeus (*infra*)

Treatment of cavernous nævi. As already mentioned many of these disappear spontaneously for they are rare in adults It is therefore rarely necessary to treat them unless they are growing or for cosmetic reasons Such nævi on the trunk etc may be left alone Cavernous nævi of the scalp should not be treated unless they are conspicuous as any measure employed may cause baldness Careful irradiation is probably the most satisfactory treatment

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Ectodermal Dystrophies

This title includes a number of developmental abnormalities affecting the skin its appendages and often the teeth In many cases the defects are hereditary or familial, and behave as recessive or dominant characteristics.



FIG. 22. Congenital alopecia with congenital dystrophy of nails. Boy aet. 4

Males are usually affected. Cockayne has attempted to classify the various types and cases have been reported showing many or all of the following defects ;—

(1) Constitutional. The individuals are delicate and undersized.
(2) Skin. This is smooth and dry as a result of complete absence

Trophœdema (Milroy's Disease, Meige's Disease)

(Gk *trophes* nourishment *oideo* swell)

A rare variety of elephantiasis of probably nervous origin characterised by chronic œdema which passes on to induration

The condition is most commonly congenital and may be familial It is more frequent in females than in males Occasionally the onset is about puberty and may be later in life Milroy found a family in which 22 members were affected and Meige one in which there were eight In 1909 Professor Bulloch collected 75 published familial cases

Clinical features The lower limbs to the ankles or knees are the parts most frequently affected but the thighs upper extremities and the face are occasionally involved The onset may be attended with neuralgic pains but there are no symptoms of inflammation Sometimes there is exaggeration of the tendon reflexes The parts are swollen and œdematous but the skin is smooth and retains its natural colour There are however deep adhesions which prevent the integument being pinched up In most cases the affected areas gradually become indurated and fibrous in others the lesions are hard when first observed The disease is unattended with any symptoms and remains stationary for years It only causes trouble by the impairment of movement Spontaneous resolution may occur but once developed the condition is usually permanent

It is interesting to note that somewhat similar conditions have been observed in association with anterior polio myelitis and lesions of the spinal cord and one theory of its etiology ascribes the condition to a congenital disorder of trophic centres in the cord Imperfect continuity of lymphatic channels through defective development is also a possible cause

Regular massage of the parts is advocated and the limbs should be supported by elastic bandages

CONGENITAL AFFECTIONS OF THE APPENDAGES OF *THE SKIN*

Congenital Affections of the Hair

In the albino the hair is fine and devoid of pigment (vide p 45)

Congenital alopecia may be universal or partial Complete absence of the hair is very rare Sequeira had four cases two in one family The *scalp and eyebrows* are completely bald and the eyelashes few in number and non pigmented The baldness may persist but in some instances there is merely delayed growth and after several years the hair begins to appear as fine down and later it becomes normal or nearly normal Congenital alopecia may be associated with dystrophy of the nails (Fig 23) and these cases with those of permanent alopecia are probably examples of ectodermal defect next to be described

Partial congenital alopecia is less rare Tracts of the scalp of varying size and shape are devoid of hair and may remain so They may be classed as a variety of nævus

In certain families the development of hair is deficient throughout *life*

No treatment either external or internal appears to have any influence upon congenital alopecia

PLATE 8



ADENOMA SEBACEUM

(Pringle type.)

vascular hypertrophy and in the third (Hallopeau) there is hyperkeratosis

Clinical features. The tumours are small yellowish or red papules bright in colour shiny and dome shaped rarely warts affecting the middle



Fig 25 Adenoma sebaceum (Pringle type). Microphotograph of section

third of the face and especially the naso labial furrows (Plate 8) They increase slowly until puberty is reached when they become stationary



Fig 26. Adenoma sebaceum (polypi and dystrophy of nails).

Small cutaneous horns may develop on the surface The following anomalies are often associated with sebaceous adenoma —

Vascular naevi pigmented naevi and cutaneous polypi

A peculiar form of flat fibroma especially above each iliac crest

Cutaneous polypi rising from the sides of the finger nails (Fig 26)

Tuberose sclerosis, in which hard, dense gliomatous tumours develop

upon the surface of the cortex of the brain. Small gliomata may be numerous under the ependyma of the ventricles and nævoid tumours may be present in the meninges. These lesions account for epileptic or Jacksonian fits and occasionally paralysis or paresis.

Cardiac and renal tumours are often associated and may cause death before puberty

Treatment. Sebaceous adenomata may be removed by the knife or destroyed by the galvano-cautery or electrolysis. When they are numerous and closely set carbon dioxide snow may be used. The results of treatment are usually disappointing

Hidradenoma. Syringoma. Syringocystoma

Congenital tumours of the sweat glands occur :—

(1) As single papillary or flat tumours which may or may not have



Fig. 27 Hidradénomes éruptifs. Tumours in intermammary and epigastric regions. Female, æt. 22.

been noticed in childhood In some of these tumours there are degenerate changes in the connective tissue of mucoid or hyaline character

(2) An eruptive form, Hidradénomes éruptifs (Jacquet and Darier) (Gk. *hudor* water). A rare affection, generally occurring in women and appearing as an eruption of pin-head to millet or split-pea-sized, skin coloured or pink solid lesions in the skin and slightly raised above the surface. The condition may occur on the face, neck, mid-chest and epigastrium, under the breasts and the sides of the chest.



FIG. 29. Epithelioma adenoides cysticum (kindly lent by Dr L. Savatard).



FIG. 30. Epithelioma adenoides cysticum (kindly lent by Dr L. Savatard).

On the face the normal structure of syringadenomata may be found The histology of lesions on the trunk varies and may show small epithelial strands suggestive of vestigial glands or may show small epidermic cysts associated with some hypertrophy of the overlying epidermis

The eruption commonly appears at puberty and is said sometimes to disappear later

Fig 27 illustrates the distribution in a girl of twenty three At the age of twenty a number of small growths were noticed on the chest and later on the back They were *confined to the intermammary triangle* and epigastrium the sides of the chest and the scapular regions The tumours were pale yellow or nearly the colour of the skin tense and hard to the touch There were no subjective symptoms

Hidradénomes éruptifs are generally believed to arise from the sweat ducts They are probably derived from congenital anomalies



Fig 28 Hidradénome éruptif Microphotograph of section

which become stimulated to growth for some unknown reason The lesions do not become malignant Spontaneous involution is rare

Treatment Benign tumours of the appendages of the skin may be excised or if small treated by electrolysis or the cautery

Syringocystoma has been successfully treated by X rays

Epithelioma Adenoides Cysticum (Brooke)

This is a remarkable congenital and familial affection of the hair follicles

The tumours appear in childhood and there is usually a history of heredity The growths are at first the colour of the normal skin or perhaps a little darker They vary in size from a pin s head to a pea but may be as large as a walnut on the scalp As they grow they often become translucent and may acquire a bluish tint In advanced cases minute



Fig. 59. Epithelioma adenoides cysticum (kindly lent by Dr L. Savatard).



Fig. 60. Epithelioma adenoides cysticum (kindly lent by Dr L. Savatard).

vessels may be seen on the surface On the face there are often many small milium like white spots and minute pigment spots The tumours are firm on palpation and move with the skin The seats of election are the central third of the face the root of the nose the nostrils and adjacent parts of the cheeks upper lip and chin (Fig 29) but the whole face and the scalp neck and upper extremities may be involved Dr Savatard believes that single tumours are often mistaken for common moles Ulceration of the growths is unknown but occasionally they become malignant The lesions consist of branching down-growths of epithelial cells in the centre of which there may be cystic formation around a lanugo hair (Fig 30) "Cell nests are a striking feature of the sections

Diagnosis may call for a biopsy The lesions may be confused with adenoma sebaceum syringocystoma or leiomyoma cutis

X ray treatment is recommended by Savatard Solitary lesions are best excised

Milium the minute pin head sized tumour found frequently multiple on the forehead in adults is described at p 670 *Tricho-epithelioma*, which *is believed to be congenital, is figured at p 660* Dermoid cysts (p 670) and congenital sinuses (p 75)

Neuro-fibromatosis von Recklinghausen's Disease, Molluscum fibrosum

(Lat. *molluscus* from *mollis* soft)

This rare condition is characterised by the formation of multiple fibrous tumours in the skin tumours on the nerve-trunks and pigmentation

Etiology The cause is unknown The condition is often associated with pigmented and other nævi In about 20 per cent of cases several members of a family are affected and the hereditary tendency is marked.

Pathology The tumours consist of fibrous tissue of an embryonic type covered by normal or slightly thinned epidermis In some there are gelatinous masses and mast cells Primitive nerve fibres and ganglion cells are also found in them Similar lesions may be widely spread in other organs.

Clinical features *The disease may be first* noticed in infancy but attention is usually called to it by the development of the tumours about puberty The whole surface of the body is studded with soft roundish tumours *embedded in the skin or sessile or pedunculated* They may be the colour of the surrounding skin or bluish or brown and in later stages often become irregular They may be of all sizes and in later life sometimes attain enormous proportions Tumours *weighing as much as thirty* five pounds have been met with It is often easy to herniate the tumours under the surrounding skin when they are of small dimensions

The *pigment* is in the form of freckles or large patches *with colour* shades from yellow to dark brown and the pigmented lesions may be scattered between the tumours or precede the tumours or more rarely be the sole cutaneous manifestations of the disease The patients are *often* but not always of low mental development.

Affections of the Nerves There may be a hypertrophic neuritis or a variable number of discrete firm, spindle-shaped or *fusiform neuro-*

fibromatous tumours along the course of nerves Such lesions are tender The condition may be associated with opaque nerve fibres in the retina.

The tumours gradually enlarge, but are of no danger to life They often entail serious discomfort from their position and dimensions.

Large pendulous tumours are called fibroma pendulum.

Dermatolysis is a variety of fibroma pendulum. Crocker described a remarkable case in which, after an accident attended with paraplegia, the buttocks and legs began to enlarge Enormous pendulous folds of skin and subcutaneous tissue "overlapping like flounces" hung from the



FIG. 31 Neuro-fibromata.

lower part of the chest half way down the thighs and down the leg below the knee. Small fibromata developed from time to time on the abdominal wall. There were no symptoms

Treatment. Where their presence causes trouble from friction or pressure or where the mass of the tumour is an impediment to movement, excision is the best treatment. In the patient figured the small tumours on the eyelids obstructed vision, and many were removed at different times We have had no success with surface or interstitial applications of radium.

Ehlers-Danlos syndrome (Cutis hyper-elastica) Here one should distinguish the fibromatous type of dermatolysis from the diffuse type (elastic skin, cutis hyperelastica) which is quite unrelated. In this condi

vessels may be seen on the surface On the face there are often many small milium like white spots and minute pigment spots The tumours are firm on palpation and move with the skin The seats of election are the central third of the face the root of the nose the nostrils and adjacent parts of the cheeks upper lip and chin (Fig 29) but the whole face and the scalp neck and upper extremities may be involved Dr Savatard believes that single tumours are often mistaken for common moles Ulceration of the growths is unknown but occasionally they become malignant The lesions consist of branching down-growths of epithelial cells in the centre of which there may be cystic formation around a lanugo hair (Fig 30) Cell nests are a striking feature of the sections

Diagnosis may call for a biopsy The lesions may be confused with adenoma sebaceum syringocystoma or leiomyoma cutis

X ray treatment is recommended by Savatard Solitary lesions are best excised

Milium, the minute pin head sized tumour found frequently multiple on the forehead in adults is described at p 670 *Tricho-epithelioma* which is believed to be congenital is figured at p 669 Dermoid cysts (p 670) and congenital sinuses (p 75)

Neuro-fibromatosis von Recklinghausen's Disease, Molluscum fibrosum

(Lat. *molluscus* from *mollis* soft)

This rare condition is characterised by the formation of multiple fibrous tumours in the skin tumours on the nerve trunks and pigmentation

Etiology The cause is unknown The condition is often associated with pigmented and other nævi. In about 20 per cent of cases several members of a family are affected and the hereditary tendency is marked.

Pathology The tumours consist of fibrous tissue of an embryonic type covered by normal or slightly thinned epidermis. In some there are gelatinous masses and mast cells Primitive nerve fibres and ganglion cells are also found in them Similar lesions may be widely spread in other organs.

Clinical features. The disease may be first noticed in infancy but attention is usually called to it by the development of the tumours about puberty The whole surface of the body is studded with soft roundish tumours embedded in the skin or sessile or pedunculated They may be the colour of the surrounding skin or bluish or brown and in later stages often become irregular They may be of all sizes and in later life sometimes attain enormous proportions Tumours weighing as much as thirty five pounds have been met with It is often easy to herniate the tumours under the surrounding skin when they are of small dimensions

The *pigment* is in the form of freckles or large patches with colour shades from yellow to dark brown and the pigmented lesions may be scattered between the tumours or precede the tumours or more rarely be the sole cutaneous manifestations of the disease The patients are often but not always of low mental development

Affections of the Nerves There may be a hypertrophic neuritis or a variable number of discrete firm spindle shaped or fusiform neuro-

fibromatous tumours along the course of nerves Such lesions are tender The condition may be associated with opaque nerve fibres in the retina.

The tumours gradually enlarge but are of no danger to life They often entail serious discomfort from their position and dimensions.

Large pendulous tumours are called fibroma pendulum.

Dermatolysis is a variety of fibroma pendulum. Crocker described a remarkable case in which, after an accident attended with paraplegia, the buttocks and legs began to enlarge Enormous pendulous folds of skin and subcutaneous tissue "overlapping like flounces" hung from the



FIG. 31 Neuro-fibromata.

lower part of the chest half way down the thighs and down the leg below the knee. Small fibromata developed from time to time on the abdominal wall. There were no symptoms

Treatment. Where their presence causes trouble from friction or pressure, or where the mass of the tumour is an impediment to movement excision is the best treatment. In the patient figured the small tumours on the eyelids obstructed vision, and many were removed at different times. We have had no success with surface or interstitial applications of radium.

Ehlers-Danlos syndrome (Cutis hyper-elastica). Here one should distinguish the fibromatous type of dermatolysis from the diffuse type (elastic skin cutis hyperelastica) which is quite unrelated. In this condi

infiltration in the skin are white grey or pale brown Angioid streaks have been noted in the retina

Microscopically the appearances suggest a curious infiltration of the dermis in which swollen and fragmented elastic fibres are surrounded by hyaline material probably resulting from degeneration of the collagen.



Fig 35 Pseudo-xanthoma Elasticum Showing thickening of abdominal wall and groins

Small granular deposits of calcium may be present, but the calcium content of the blood is normal and the true significance of the histological findings is not understood but suggests a systemic degeneration of the elastica

There are usually no symptoms and the condition may remain unchanged for many years without appreciable effect upon the patient's general health

Neuroma

These are exceedingly rare tumours arising from the neurilemma They are chronic, painful flat tumours imbedded in the skin of small size not exceeding a small pea or nut Pain radiates from the growth when it is handled and sometimes there are paroxysmal attacks Removal of a *portion of* the nerve supplying the affected area has been found to relieve the symptoms

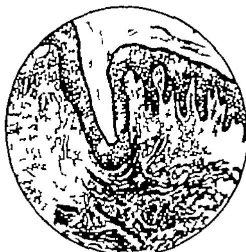


Fig. 86. Neuroma. Nerve fibres : gold stain.

Plexiform neuroma may be associated with congenital hypertrophy of a limb or digits

Glomus tumour

The glomus tumour (Masson) is a small encapsulated growth whose origin is mainly the modified unstriped muscle cells of the neuro-myo-arterial junction which constitutes the normal glomus (*vide* p 7). If superficial



Fig. 87



Fig. 88.

Glomus Tumours (Kendall and Thomson).

the tumour appears as a blue, purplish or reddish spot or soft papule; if deep it may be invisible. It is most common on the hand and the most suggestive features in diagnosis are the severity and paroxysmal character of the pain, readily provoked and out of all proportion to the size of the lesion

The tumours appear commonly in the nail bed or pulp of the finger or

xerodermia pigmentosa agrees in all respects with a simple recessive character due to a single gene The irritation of the actinic rays of light is the exciting factor as in cases of porphyrinuria congenita thus suggesting that a metabolic error is the underlying cause However no sensitising substance corresponding to hæmatoporphyrin has been demonstrated although Usuba claims to have made normal skin light sensitive by injecting serum from a patient with xerodermia pigmentosa. The condition closely resembles the chronic dermatitis which occurs in X ray workers and as a sequel to excessive treatment *(vide* p 315)

All the lesions characteristic of xerodermia pigmentosa are found in the skin of the aged, in which also there is great liability for pigmented warts to become malignant

Pathology Kaposi who first described xerodermia pigmentosa believed that the first parts to be affected were the papillary body and the *epidermis Atrophy of the papillary layer is always present and the rete* is thinned in the white patches of the skin In the pigmented spots granules of pigment are found in the epidermal cells and also in the corium *The warty nodules consist of masses of stratified epidermis which send down* processes into the true skin The malignant growths are squamous-celled epitheliomata and in sections of one of our cases numerous cell nests *of the usual type were found in the many tumours removed Melanotic* carcinomata have also been observed

Clinical features Photophobia is the earliest symptom and redness of *the conjunctiva with erythema of the skin exposed to sunlight occur next* sometimes within a few weeks or months after birth In severe cases the first exposure to sunlight results in an acute eczematous dermatitis of the face and hands so that for a few summers the condition *is mistaken for* acute facial eczema until the unusual degree of freckling draws attention to the true diagnosis The freckles are yellowish brown in colour but unlike the common ephelides do not disappear *with the approach of* winter As time goes on they increase in number and then minute permanently dilated capillaries—telangiectases—are noticed The next feature is the formation of a number of small dry warty *papules and* nodules The nodules usually fall off after a time leaving small atrophic patches which ultimately become white The scarring about the lids leads to ectropion and its attendant troubles From time to *time however the* warty nodules instead of dropping off begin to grow rapidly producing in a few days or weeks large tumours which are true carcinomata The little girl figured (Plate 4) had been under Sequeira s care *for seven years, and* during that time about twenty growths of this type had been removed. She was seen once a month, and the tumours were removed before the glands were involved She was however removed *from observation for some* months and when last seen was obviously near death from extensive malignant disease Occasionally as in the case just mentioned, there is a xerodermatous condition of the scalp and *covered parts The activity of* the process varies from time to time and is always increased in the summer months

We have seen one case in *which the disease apparently of* the same type, developed in a young man constantly exposed to wind weather and excessive sun in the fields Similar cases have been recorded

PLATE 4



XERODERMA PIGMENTOSUM

Girl, aged ten, affected from early infancy. Multiple freckles, pigmented warts, telangiectases, atrophic spot and an epithelioma at the left inner canthus. The scar at the left angle of the mouth was the site of another epithelioma. Many similar neoplasms have been removed. The backs of the hands were also affected.

Prognosis. Nearly all the patients die early. In some cases the malignant neoplasms produce metastases in the internal organs.

Treatment is purely palliative. The skin may be protected from the actinic rays of the sun by thick red veils or by the application of pigmented powders and salves (see treatment of erythema solare, p. 800). Early removal of the cancerous tumours is important. Treatment of the warts and tumours by X rays and radium has been recommended, but they often fail. Cases occurring in tropical areas should be sent home at once.

Congenital Sinuses

These anomalies occur as the result of incomplete fusion of foetal segments or the persistence of embryonic ducts and clefts. Examples are seen —

(1) In the midline of the neck (thyro-glossal cysts).
(2) In front of the ear (pre-auricular sinus).
(3) At the sides of the neck (branchial sinuses).
(4) In the natal cleft (pilo-nidal sinus).
(5) On the nasal bridge.



FIG. 40. Abscess of pre-auricular sinus.

Cysts may arise or infection may occur at these sites giving rise to lesions simulating scrofuloderma. Treatment is often unavailing unless the true origin of the lesion is recognised and the whole of the vestigial structure is excised. This may be difficult and small persistent sinuses are not uncommon after radical surgery. Sometimes healing results after irradiation with radium or X rays and zinc ionisation may be successful.

adult requirements. An International unit is equivalent to 0 33 microgrammes of crystalline vitamin A

Results of deficiency This form of avitaminosis causes atrophy of the epithelium of the mucous surfaces and the ducts of the secreting glands. The atrophy is followed by free keratinisation which may obstruct the ducts At the same time the epidermis may become dry and the buccal mucosa



FIG. 41 Avitaminosis Crazy pavement" skin. Deficiency of nicotinic acid.

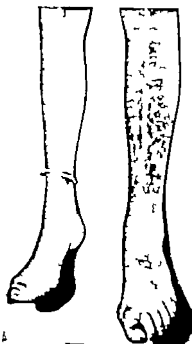


FIG. 42 Avitaminosis "Crazy pavement" skin. (Vitamins A and B partially complementary)

may be involved. Later the eyes are affected, the corneae becoming keratinised (xerophthalmia) and this may proceed to the more serious condition known as keratomalacia.

Phrynoderma (Gk. *phryne* toad)

Phrynoderma was first related to hypovitaminosis among the poorly fed populations of China, Southern India, Ceylon and East and Central Africa. There is good reason to believe that sub-clinical deficiency of vitamin A is widely prevalent in many countries. In the tropics the majority of the subjects of phrynoderma subsist chiefly on cereals. Among Europeans there is deficiency of the lipochromes or carotenoids of fish-liver oil, milk, egg-yolk, carrots and certain other vegetables. No doubt factors other than vitamin A are also involved in this group.

Clinical appearances. The whole skin is dry There is an eruption

GROUP 2

DERMATOSES OF INTERNAL ORIGIN

Constitutional, Endogenous, etc.

CHAPTER IV

CUTANEOUS AFFECTIONS IN GENERAL DISEASES INCLUDING VITAMIN DEFICIENCIES

VITAMINS AND THE NUTRITION OF THE SKIN

The nutrition of the skin and its appendages is profoundly influenced by deficiency of certain vitamins in the body. Those of most importance in dermatology are :—

Vitamin A, Thiamin (vitamin B_1), Riboflavin, Niacin (nicotinic acid), *Pantothenic acid* and probably other members of the B_2 complex, vitamins C, D and K.

The general problems of avitaminosis, the factors which predispose to it, the part played by storage in the body and the estimation of the degree of deficiency by laboratory tests are best studied in works on General Medicine or in monographs such as Bicknell and Prescott's "The Vitamins in Medicine." Here it will suffice to indicate the sources of the vitamins concerned, the requirements of the healthy body, with details of the cutaneous manifestations and the natural and artificial sources from which the deficiencies may be corrected. Wherever possible we urge *the employment of natural products rather than those of synthetic origin.*

The deficiencies may be due to :—

(1) Partial or complete absence of one or more vitamins from the diet.

(2) Diseases of the alimentary canal, especially conditions attended with diarrhœa, *e.g.*, ulcerative colitis or dysentery, which prevent the absorption and utilisation of the vitamins.

(3) An inborn defect of metabolism which renders the individual incapable of assimilating foods containing the necessary factors. Before we consider the different forms of hypovitaminosis it is important to realise (1) that deficiencies are seldom single and that in many cases there is deprivation of several vitamins, and (2) that similar symptoms and even identical responses to therapeutic tests occur in several forms of avitaminosis.

VITAMIN A

The *natural sources* of this vitamin are the oils from fish liver—cod and especially halibut ; milk and milk products—cream, butter, cheese ; yolk of egg, kidney and liver ; carrots and green vegetables. *Vitamin A is fat-soluble* and fats are necessary for its absorption.

Normal requirements. The adult requires 4,000 to 6,000 international units daily ; infants and growing children need proportionately more—1,500 to 5,000 I.U. Pregnancy and lactation demand an increase of 50 per cent. on the

associated with secondary infection is keratomalacia, characterised by dryness and ulceration.

Treatment. An adult requires 4 000 international units daily. Children demand 50 to 100 per cent. more. The eruption and the associated phenomena usually clear up rapidly with the administration of cod or



FIG. 44. Phrynoderma. (Reproduced by permission of Dr Aykroyd.)

halibut-liver oil. The latter has a high content of the vitamin. Some commonly used proprietary preparations, Radiostoleum or *Adexolin* (A) and (D), and Avoleum (A) supply the vitamin. In West Africa and elsewhere red palm oil is used. The pure oil is unpalatable but mixed with other vegetable oils in the proportion of 15 per cent. it is usually acceptable.

Other Follicular Keratoses and Xeroderma

Certain other follicular keratoses (p. 706) and sometimes xeroderma (p. 39) may be due in part to vitamin deficiency or to some inborn defect of metabolism for these dermatoses may respond temporarily to vitamin A therapy.

Recent observations, moreover show that at least two other diseases characterised by follicular keratosis may ultimately be included in this group of deficiency diseases viz. Darier's disease (keratosis follicularis) and pityriasis rubra pilaris. These will now be considered.

Keratosis follicularis (Darier's disease) (page 712) has been attributed to vitamin deficiency but this has not been established.

Darier's disease is rare and its etiology remains obscure but evidence

of rounded dome shaped papules at the pilo-sebaceous orifices Each papule is never more than 4 millimetres across They are closely set and produce a peculiar rough surface which Nicholls likened to toad skin (hence Phrynoderma) The papules do not suppurate and leave no scars The areas most affected are the outer surfaces of the arms and the anterior and external aspects of the thighs The buttocks loins and back may be involved and after puberty the chin and adjacent parts may show papules The mouth and tongue are commonly sore (Figs 43 and 44).

Histologically the papules are found to be the wide-open orifices of



FIG 43 Papular eruption in African (Phrynoderma). (Reproduced by permission from the late Dr E. C. Smith's " Atlas of Skin Diseases in the Tropics.)

the pilo sebaceous glands filled with a mass of horny material. They thus resemble the comedo of acne vulgaris

Ocular phenomena Phrynoderma is accompanied by ***night-blindness*** (hemeralopia) Both the visual purple and violet are developed from vitamin A Regeneration after bleaching by bright light can only be effected by a supply of the vitamin. The rate of recovery has been taken as a measure of deficiency and a dark adaptation test has been used

Keratinisation of the corneal epithelium *xerophthalmia* (xerosis corneæ) is seen in the more severe cases Localised dry foam like plaques on the corneæ constitute Bitot's spots A further development, possibly

stration of the vitamin B group in the form of parenteral injections of 3 to 5 c.cm. of liver extract daily

Other applications. The neuralgia of zoster may be relieved by thiamin, and very large doses have been found useful in lichen planus Thiamin is said to be a useful complement to actino-therapy in the treatment of psoriasis.

Two milligrammes daily are recommended for the relief of the pruritus of pregnancy and similar doses appear to be of value in the neuro dermatoses.

VITAMIN B_2, RIBOFLAVIN, LACTOFLAVIN

Natural sources. Riboflavin is an important constituent of yeast One kilogramme of yeast yields 20 milligrammes of the vitamin The green leaves of vegetables, milk, liver kidney and fish-roe are other sources.

Normal requirements Adults need 2 to 3 milligrammes a day; children from 1 to 2 milligrammes. There is no international unit.

Effects of deficiency Ariboflavinosis has been studied experimentally as well as clinically and some of its results are now well defined. The angles of the mouth, adjacent skin and mucous membranes are chiefly affected. The syndrome is common in pellagra, where it is associated with deficiency of nicotinic acid. Ariboflavinosis is seen in the clinics in Great Britain, but is especially common in some tropical countries where an ill balanced diet is the rule. Aykroyd and Krishnan found many cases in children in mission hostels in Southern India, where the inmates lived chiefly on parboiled rice. Deficiency of this vitamin has been seen in the new born infant when the antenatal diet of the mother has been grossly defective.

Angular Stomatitis (Perlèche)

It is probable that the subject of ariboflavinosis will have to be revised with further knowledge There is reason to believe that some of the discrepancies in reports may be due to the fact that other factors are essential for the proper utilisation of riboflavin.

It should also be emphasised that cheilosis may be due to local causes,

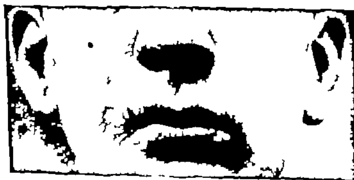


FIG. 43 Angular Stomatitis. Perlèche. Ariboflavinosis.

indicates that deficiency of vitamin A is partly responsible. Peck, Chargin and Sobotka (1941) and Porter and Codding (1945) found that large doses of the vitamin and a dietary rich therein could effect a cure According to Darier the disease occurs more frequently in males than in females but is so rare a disease that sex incidence is of little importance In twenty five years experience at the London Hospital Sequeira saw three female and no male cases Small family outbreaks have been reported, and though this suggests infection it does not exclude hereditary or acquired avitaminosis for Pohlmann recorded the transmission of the disease through three generations

Pityriasis rubra pilaris (p 710) The disease is rare in this country At the London Hospital the patients were between the ages of twelve and thirty five but instances of earlier and later development occur The sex incidence seems to vary in different countries Males predominate on the Continent and females in London clinics

Some evidence that deficiency of vitamin A is, at any rate a factor in the causation of the disease was obtained by Brunsting and Sheard, who described a definite response to large doses of the vitamin and also reported changes in dark adaptation Other observers have not had such success in the treatment of pityriasis rubra pilaris but a therapeutic test should be made using large doses of vitamin A with adequate supplies of the natural substances containing the vitamin in the diet. These include liver milk eggs butter and vegetables

VITAMIN B_1, THIAMIN ANEURIN

Natural sources The chief sources of this vitamin are the pericarp and germ of cereals Their removal in the polishing of rice causes beri-beri Other vegetable sources are nuts and legumes Thiamin is also present in yeast egg yolk liver and pork

Normal requirements An adult requires 1 milligramme of the vitamin (320 international units) daily Two milligrammes are the optimal dose A pregnant or suckling woman needs twice as much; infants and children 0 25 to 0·6 milligramme daily

Thiamin is essential for carbohydrate digestion Deprivation causes impairment of the nutrition of nerve-cells, with the development of the classical symptoms of beri beri *i.e* peripheral neuritis with hyperæsthesia anæsthesia, cramps and weakness and in many cases, œdema.

Thiamin and the seborrhœides. There is considerable evidence to show that thiamin deficiency plays an important part in the development of what are known as seborrhœic skin affections This appears to be due to its effect upon the oxidation of carbohydrates Three milligrammes of the vitamin given two or three times a day often prove of value in these dermatoses The seborrhœic eruptions associated with ariboflavinosis (p 82) and deficiency of nicotinic acid (p. 81) may do better if thiamin is added to the other members of the vitamin B complex (*vide* p 202)

It has also been shown that there is a group of seborrhœides associated with gastric dysfunction which rapidly respond to the admini

PLATE 5

PELLAGRA

posterior cornua and Clarke's column. Degeneration of the nerve fibres in the posterior roots and columns and in the peripheral nerves also occurs. The cells of the brain cortex are swollen and disintegrated and there is an increase in the neuroglia.

Clinical features. The eruption occurs most commonly on the face, sometimes with a "butterfly" distribution across the nose, on the neck and the backs of the hands, *i.e.* because the skin is *hypersensitive to light*. *Casal's collar* is the name given to a V-shaped collar-like band not uncommon in pellagrins. It is 2 to 3 inches wide and at first has a red colour and then becomes pigmented and scaling.

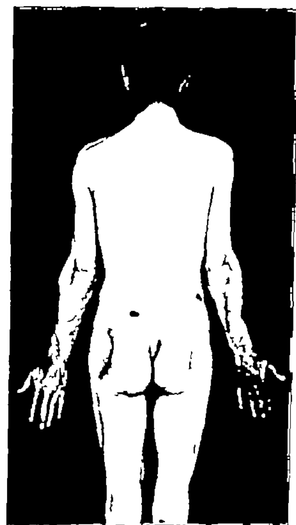


Fig. 47. Pellagra. Gastro-intestinal and nervous symptoms. Melancholia.

Not only does exposure *to light determine the areas affected* but pressure or friction may act similarly. Thus the elbows, knees, the ischial tuberosities and even a prominent seventh cervical vertebra may provoke the characteristic appearances. The *affected areas* are bright red or livid and swollen, and there are sensations of burning and itching. The erythema has a distinct line of demarcation. (Plate 5.) The eruption disappears in the winter but returns in the spring and lasts through the summer. In protracted cases the skin becomes thickened and pigmented and ultimately undergoes atrophy. There is *often an associated nasal and facial seborrhœa*.

The lips, tongue and mouth are *inflamed* and covered with small vesicles and ulcers. The parotid glands are often swollen, and there is salivation. The bowels may be loose or constipated and abdominal pain is common.

There is progressive loss of strength, with attacks of vertigo and tremors. Melancholia, mental deterioration and insanity bring a number of patients into the asylums. Convulsions, tabetic symptoms, paralyses and optic neuritis and retinitis may occur.

Prognosis. Pellagra if untreated, runs a chronic course and may end fatally in four or five years. Under modern treatment the outlook has

entirely changed and a cure may be expected if the disease is treated promptly and relapses are avoided by suitable diet.

Treatment. While attention to the general hygiene is of value the object of treatment is to supply the deficiency in nicotinic acid. Five hundred milligrammes of the acid or nicotamide daily in divided doses of 50 milligrammes rapidly remove the major symptoms. Should there be failure in one or more of these to respond, it may be taken as certain that there is lack of one or more of the other elements of the vitamin B complex. As all these factors are present in yeast, it is obviously wise to prescribe this natural source in treatment. The addition of half an ounce of yeast to the diet three or four times a day has *an almost immediate effect upon the* pellagrin. Children should be given 2 to 4 grammes (half to one teaspoonful) thrice daily. We indicated above that we are ignorant as yet of the part played by the stomach in pellagra and recently Sydenstricker and his colleagues have shown that the effect of nicotinic acid is greatly enhanced by giving patients gastric juice derived from healthy persons or from preparations from pig stomach.

References—Bicknell and Prescott "The Vitamins in Medicine," 1946, Heinemann. H. S. Stannus, 1936, *Trop. Di. Bulletin*, 33, 59. V. P. Sydenstricker, 1943, *Proc. Roy. Soc. Med.*, 36, 169. Sealy Harris, "Clinical Pellagra," 1941. Good illustrations. H. S. Platt, 1945, *Brit. Med. Bull.*, 3, 170

Acrodynia (Gk. *akron*, extremity; *odune*, pain)

This is a rare affection, possibly allied to pellagra. Some large epidemics have been recorded, chiefly early in the last century in France, Belgium, and elsewhere. It must not be confused with Erythroedema, which has sometimes been called "Acrodynia" by American writers.

Symptoms. The eruption started on the hands and feet and spread to the limbs and trunk. It was erythematous, and followed by desquamation and pigmentation. Vomiting and diarrhoea suggested some poison taken as food. Cutaneous hyperaesthesia followed by anaesthesia, cramps and paresis were noted. The disease was rarely fatal.

So-called Atypical Pellagra

We include here for convenience certain dermatoses caused by vitamin deficiency mainly multiple but including deprivation of nicotinic acid. We are aware that it may appear illogical to apply the term "pellagra" to them for the clinical manifestations vary with the combination of vitamin deficiencies. For instance, the clinical picture may be complicated by symptoms of beri-beri or sprue. In sprue the integument may resemble parchment, and this condition is cured by nicotinic acid. In rare instances a condition which has been called pseudo-scleroderma may be produced by multiple-avitaminosis, and is curable by the exhibition of nicotinic acid with ascorbic acid. In the condition known as "Kwashiorkor" (*vide infra*) the involvement of the hair suggests absence of other members of the vitamin B complex.

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Keratosis of the Skin of the Legs

This is a common condition in native children in East Africa skin of the shins is *most affected* The *integument* looks as if it had painted with black varnish or lacquer and that this had cracked (Fig It resembles the condition seen in young children described later (Kwashiorkor) The skin over the knuckles is thickened and wrink The subjects are on an inadequate diet and nicotinic acid will rapidly c up the keratosis

"Kwashiorkor" Infantile Pellagra Gillan's Œdema

This remarkable affection was first observed by Procter in 1920 amo weaned infants of the *Kikuyu a vegetarian tribe in Kenya It has sin* been described as Kwashiorkor by Dr Cicely Williams on the West Coa *and by Gillan* who was impressed with the concomitant œdema T most striking features are —

(1) Generalised pallor of the skin The dyschromia is so pronounce that on entering a ward it is quite easy *to detect the affected children amon* the other black infants The hypo pigmentation is a valuable diagnosti feature The skin is of a coffee or copper colour (Fig 48)

(2) The hair is affected There may be general thinning or even com



Fig 48 Kwashiorkor Infantile pellagra.
(Reproduced by permission of Dr Trowell)

plete alopecia The hair is very fine and brittle and devoid of the natural tendency to curl It is pale grey or coffee-colour When inspecting the scalp of one of these infants one is reminded of the grey haired elderly native

(3) *There are* jet black patches of hyperkeratosis varying in size from spots ¼ inch across to large plaques involving extensive areas *of the trunk* and limbs The black patches are shiny and look as if they had been varnished and that the surface had cracked *especially* at the flexures. They thus produce an appearance which has been aptly likened by Dr Cicely Williams to a "crazy pavement" (Figs *41 and 49*)

(4) *Pale areas are seen round the mouth and nose* and the "napkin" area, probably owing to discharges They vary in tint from white to pink or coffee colour They also occur in the flexures.



PINK DISEASE. ERYTHRŒDEMA

[To face p. 87

(5) Angular stomatitis is common. Similar erosions are seen round the nostrils and the ocular canthi and the anal region. The external genitals are raw particularly the scrotum.

The nails are thin and often ridged longitudinally Sepsis is common Œdema is often present. Most of the infants are brought to the clinic on account of swelling of the feet and legs. When the œdema subsides, extreme emaciation becomes evident Diarrhœa and the passage of large pasty motions are present in most cases.

Nearly all the early cases seen proved fatal. The recognition that the syndrome is due to vitamin deficiency has resulted in a large proportion of cures. Many infants have been saved by the administration of a teaspoonful of marmite daily for each year of age Milk and eggs are added to the diet. Yeast would be equally beneficial. In the grave cases liver has been found a valuable addition to the above

T and J Gillman of Johannesburg finding by liver biopsy in the grave cases of kwashiorkor extensive fatty degeneration, introduced treatment by hog's liver They found that 10 grammes daily of dried hog's liver with dilute hydrochloric acid were almost a specific and saved many infants (*Journ. Amer Med. Assocn.* (1945) 20 13).

Trowell in Uganda has confirmed their observations.

REFERENCES—L. B. CARRUTHERS, 1941, *Trans. Roy. Soc. Trop Med. Hyg.* 35, 31 H. S. STANNUS, 1936, *Trop Dis. Bulletin* 33, 39. H. C. TROWELL, 1942, *East Afr Med. Journ.*, 18, 302 (Literature). J H. KOOTCER and J YUDKIN 1942, *Lancet*, 2 753. Slit-lamp Microscope in Nutritional Surveys. D FITZGERALD MOORE, 1939, *Jour Trop. Med. Hyg.*, 42, 109 Retro-bulbar neuritis in Pellagra in Nigeria.

Erythrœdema (Pink Disease) Infantile Acrodynia

A rather rare affection of debilitated infants characterised by redness and œdema of the extremities (Plate 6)

This condition was first described by Selter in 1903 but we owe the first full account to Swift in Australia, where the disease is relatively common. It has however been known in the children's hospitals of this country for a long period. Sequeira has seen one case in Kenya. The disease occurs in children from the fourth month to the third year There is usually a history of previous febrile illness. The infant is miserable and refuses to smile. There is distaste for food and insomnia.

The rash affects the hands, feet, cheeks and nose. The parts are red and swollen and do not pit on pressure at first. The appearance of the hands suggests a raw beef steak, its colour fading at the wrists. The erythematous skin peels later Free sweating is a common feature and then the extremities become sodden and there is great irritation. The child has a mouse-like odour It lies humped up, turned on its face with the knees drawn up. The face is rubbed from side to side on the bed and there is photophobia. The muscles are in a state of hypotonus, the mouth hangs open. The teeth may drop out, and there may be ulceration on the tongue The hair falls out, leaving bald patches. The knee jerks are diminished or absent and the sensation to pain is diminished

Tachycardia is a characteristic symptom, the pulse being as frequent as 120 to 140 per minute for months.

At the onset the age of the child makes "dentition" the common diagnosis, but the more serious phenomena soon demand attention.

The cause of erythroedema is somewhat doubtful It has been suggested that it is due to an infection but the symptoms and the response to treatment make vitamin deficiency more probable There is evident polyneuritis but there are no changes in the cerebro-spinal fluid and only slight leucocytosis in the blood

Treatment. The child requires careful nursing The diet should contain all the vitamins Artificial light baths are recommended and judicious sun bathing has been found of value

The prognosis is good and complete recovery may be expected in three to six months

REFERENCES.—SWIFT *Trans Tenth Australian Med Congress* Auckland 1914 p. 547 H HUTCHISON 1931 *Lancet* 2 970 JEFFREYS WOOD and [illegible] *Brit Med Journ* 1935 2, 527 531

VITAMIN C, ASCORBIC ACID

Natural sources The natural sources of vitamin C are fresh fruits and certain vegetables Black currant contain the highest proportion and then come the citrus group oranges lemons grape-fruit Tomatoes rose-hips, potatoes and green vegetables also contain the vitamin In South Africa the guava is a valuable source and in the U.S.S.R green walnuts are largely employed

Normal requirements An adult requires from 50 to 100 milligrammes of ascorbic acid daily Pregnant and suckling women need 150 to 300 milligrammes (1 milligramme is equivalent to 20 international units) Senile patients and those suffering from fever should have an increase on the normal adult dose Infants require 40 milligrammes a day

Two types of scurvy and various sub-scurvy conditions require consideration.

Scurvy, Scorbutus

It is calculated that in the adult deprivation of vitamin C will cause acute scurvy in from four to six weeks. Experience in Africa confirms this estimate where natives who make long treks to get work in the mines not uncommonly arrive at their destination suffering from frank scorbutus. Otherwise definite scurvy is now rare except in time of war and famine but *sub-scurvy states are far from uncommon in most European* communities

The earliest signs of deficiency of vitamin C are identical with those occurring in vitamin A deprivation viz. dry skin, and follicular keratosis Scattered acne lesions appear on the chest and back The characteristic feature however is hæmorrhage into the hair follicles and other evidences of capillary fragility

The vitamin is also believed to play a part in the formation of erythrocytes and deprivation is attended with anæmia. Ascorbic acid is also credited with maintaining the resistance of the body to infection (*vide infra*)

There is also reason to believe that the adrenals require a certain amount of vitamin C and that where this is deficient, pigmentation of the skin occurs just as it does from adrenal dystrophy in *Addison's disease* Clinically it has been found that excessive pigmentation associated with chronic alimentary tract disease is diminished by the oral or parenteral administration of ascorbic acid

It is probable that in most cases of scurvy there is deficiency of vitamin P as well as of ascorbic acid.

Clinical features of scurvy As already mentioned the earliest signs are dryness of the skin and the formation of papules at the pilo-sebaceous orifices. The characteristic feature however is hæmorrhage into the hair follicles. Each hæmorrhagic point is centred by a hair The areas most commonly affected are the thighs and legs the buttocks and the backs of the calves being especially involved Large ecchymoses are often present on the outer sides of the ankles and in the popliteal spaces. There is also bleeding into muscles and joints and under the periosteum The *gums* show characteristic signs. Scurvy causes a stomato-gingivitis. The gums are turgid and swollen and bleed easily The dental papillæ are hypertrophied and the teeth may become loose. These features are most marked about defective teeth, and in the edentulous the gums are not affected. Ulceration of the gingival mucosa is common and is attended with a very offensive odour Actual gangrene may supervene. It should be noted that the gingivitis may precede the cutaneous manifestations.



Fig 40 Scurvy Large ecchymoses Dr E Davis

The general symptoms of severe scurvy are emaciation, anæmia, fever and asthenia.

A *pseudo-scleroderma* apparently due to avitaminosis occurs rarely It yields to treatment by ascorbic acid and niacin.

Treatment. Scurvy responds rapidly to treatment by ascorbic acid. This should be given in doses of 50 to 100 milligrammes a day Pregnant women and those suckling require 150 to 300 milligrammes The senile and patients suffering from a febrile illness demand an increase on the normal adult dosage Orange and lemon juice are important prophylactics and are valuable in treatment. In some cases a better response is seen to natural than to synthesised products. It is believed that this may be due to the fact that vitamin P deficiency occurs in scurvy as well as deficiency of ascorbic acid.

Black-currant juice is even richer in the vitamin than the citrus fruits, as is the guava, a native African fruit.

A form of scurvy characterised by hæmorrhages into the muscles of the thighs and the popliteal spaces has been seen in East Africa. The skin is unaffected.

Infantile Scurvy Barlow s Disease

This form of scurvy occurs in babies from six months to two years old. An infant deprived of vitamin C for six months becomes pale, with puffi

The cause of erythrœdema is somewhat doubtful. *It has been suggested* that it is due to an infection but the symptoms and the response to treatment make vitamin deficiency more probable. There is evident polyneuritis but there are no changes in the cerebro-spinal fluid, and only slight leucocytosis in the blood.

Treatment. The child *requires careful nursing*. *The diet* should contain all the vitamins. Artificial light baths are recommended and judicious sun bathing has been found of value.

The prognosis is good and complete recovery may be expected in three to six months.

References—Swift *Trans Tenth Australian Med. Congress*, Auckland, 1914 p. 347. R Hutchison 1931 *Lancet* 2, 979. Jefferys Wood and Fox *Brit Med Journ* 1935 2, 577 581.

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intolerance to the organic arsenicals. The effect is not specific for ascorbic acid acts in the same way in eruptions caused by gold. Serum rashes also prove less severe if the vitamin is given and some cases of urticaria are benefited by taking citrus fruits.

Ascorbic acid and methaemoglobinaemia. Methaemoglobinaemia, which may be an inborn error of metabolism or produced by certain poisons, *e.g.*, sulphonamides, even in medicinal doses, causes the skin to take on a slate-blue colour. Treatment by daily intravenous injections of 100 milligrammes of ascorbic acid converts the methaemoglobin into haemoglobin.

VITAMIN D_2 and VITAMIN D_3 CALCIFEROL (Synthetic)

The natural sources of vitamin D_3 are the fish-liver oils, milk, butter and eggs. It is oil-soluble. Five hundred international units daily will prevent rickets in children. For growing children the daily dose may be doubled with advantage. Exposure to sunlight will produce a large proportion of these requirements. The pregnant and suckling woman requires large doses of vitamin D.

Calciferol is the synthetic equivalent with similar biological effects.

The only cutaneous conditions observed in rickets are pallor and excessive sweating especially on the head.

The diseases of the skin which respond well to the administration of calciferol are lupus vulgaris, scrofulodermia, tuberculous ulcers of the indolent type, such as occur in Bazin's disease, and some of the larger papulo-necrotic tuberculides and some cases of acne vulgaris, perniosis, urticaria and eczema. We have in our moderate experience not seen the beneficial results reported to have followed the giving of 300 000 to 400 000 units daily for three to six months in cases of pemphigus vulgaris, dermatitis herpetiformis and psoriasis, but Dowling (1946) reported good results in lupus vulgaris with continued doses of 150 000 units daily (see p. 490)

VITAMIN K

Natural sources. Vitamin K is present in green plants, of which alfalfa (lucerne) and spinach, give the richest supply. Cabbage, cauliflower, carrot tops, kale, tomato and potato are less useful sources. The vitamin is also found in liver oil and some other animal tissues.

The *normal requirements* have not been ascertained.

Effects of deficiency. The essential result of deficiency is the prevention of the formation of prothrombin. Hence the clotting time of the blood is increased and there is a tendency to haemorrhages (*vide* Purpura, p. 284). Prothrombin is formed in the liver and fat is necessary for the absorption of vitamin K, which is fat-soluble. Hence obstruction to the entry of bile into the bowel will impair its absorption. Deficient absorption may also be caused by chronic diarrhoea, such as occurs in colitis, sprue and pellagra.

An important effect of vitamin K deficiency is a tendency to haemorrhages in the new born infant. This inherited condition may be cured by the administration of the vitamin or an analogue (Synkavit). To anticipate such a serious affection of the infant it is suggested that the expectant mother should take the vitamin or an analogue. Ten milligrammes are

ness of the face hæmorrhages into the skin and a purple swelling of the gums Actual bleeding from the gums is rare but petechiæ may be seen on the palate Beneath the periosteum of the limbs there are hæmorrhages attended with extreme tenderness There is often much œdema overlying the subperiosteal hæmorrhages and there may be bleeding into one or both orbits

Treatment. Barlow's disease can be prevented by *giving the infant* orange juice A baby *requires 40 milligrammes of ascorbic acid daily* Infantile scurvy yields rapidly to treatment by the vitamin.

Latent scurvy This is far from uncommon and may only become manifest on extra exertion or the advent of some intercurrent infection. The possibility of an unexplained purpura being scorbutic should be remembered by the practitioner

In practice it will be found that vitamin C even in the absence of evident sub-scurvy states favours the healing of most superficial injuries and infections of the skin for instance impetigo Sub-scurvy states may

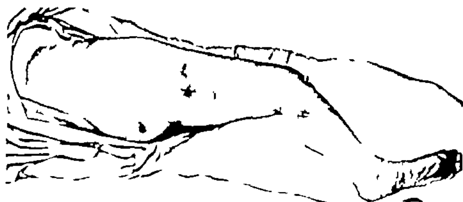


Fig 50. Infantile Scurvy Ecchymoses and subcutaneous hæmatoma

delay the healing of operation wounds and it is now the practice of some surgeons to anticipate the development of this complication by anti scorbutic treatment especially when they operate on the alimentary tract.

Bleeding gums *Trench mouth* was a common malady in the 1914–18 war It has also been seen in the recent war Ungley and Horton recently reported 51 cases of sore and bleeding gums in naval *personnel* with no evidence of vitamin C deficiency although most of the ratings were unsaturated In 85 per cent of the patients there was Vincent's stomatitis.

Vitamin C in arsenotherapy Hypersensitivity to the organic com pounds of arsenic used in syphilo therapy occurs most frequently in persons with *vitamin C deficiency The administration of ascorbic acid* accelerates recovery from arsenical dermatitis. The dose is 500 milli grammes daily for a week *It is given intravenously* and is followed by smaller doses orally This treatment of a serious and even dangerous *complication* has the further great advantage that full doses of the arsenicals may be resumed when the skin eruption has cleared up It is probable that vitamin C may prevent or modify other manifestations of

intolerance to the organic arsenicals. The effect is not specific for ascorbic acid acts in the same way in eruptions caused by gold. Serum rashes also prove less severe if the vitamin is given and some cases of urticaria are benefited by taking citrus fruits.

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given daily orally or by intravenous or intramuscular injection Some cases of urticaria have responded to this therapy

Cutaneous ulcers in ulcerative colitis. Deep sloughing ulcers have been observed at the Mayo Clinic and by Hurst in cases of ulcerative colitis They may be associated with conjunctivitis scleritis and iritis and are believed to be due to vitamin deficiency in an anemic subject. Pellagra may also occur (*vide supra* p 82)

Reference—A F Hurst (1930) *Lancet* 2 1100

Carotinæmia (Aurantiasis)

Carotene is a hydrocarbon found in carrots oranges, yellow turnips, spinach, lettuce beans and kale It is also present in egg yolk butter and milk and the yellow fat of animals. An allied substance gives the red colour to the tomato Carotinæmia is the presence of carotene in the blood serum It is characterised by a canary yellow to orange or brown dyschromia of the extremities and occasionally of the face and trunk The sclerotics remain clear The general symptoms are wasting weakness and low blood pressure In the majority of the cases recorded there has been glycosuria. Rabinovitch states that 74 5 per cent of the patients suffering from carotinæmia require insulin A yellow discoloration of the skin is found in most (but not all) patients suffering from excess of cholesterol in the blood with or without diabetes (*vide* Xanthoma diabeticorum p 97).

Carotinæmia may be caused by dietetic eccentricities such as the ingestion of large numbers of oranges, carrots eggs and tomatoes Sequeira saw two cases in Europeans resident in East Africa but obtained no history of abnormal diets, and Castellani described "ochrodermatosis or "yellow disease in Europeans living in low lying districts in Ceylon.

Carotinæmia may be mistaken for jaundice but the distribution of the dyschromia on the extremities and the clear sclerotics are distinguishing features Dietetic abnormalities should be enquired into and should there be hypercholesterolæmia or glycosuria, insulin and a special dietary are required

Onyalai

This disease which appears to be due to vitamin deficiency occurs mostly in Portuguese West Africa in East Africa Northern Rhodesia and the Belgian Congo

It was believed to be infectious and the frequent onset with fever a temperature perhaps of 103 supported this view There are mental confusion lassitude and dullness but the characteristic features are hæmorrhages into vesicles on the hard palate the buccal aspects of the cheeks the tongue and the lips. In the native blebs containing blood may occur in the axillæ. Epistaxis is a frequent symptom and also subconjunctival hæmorrhages. The urine may contain blood and there may be melæna The disease may end fatally and at autopsy hæmorrhages are found in the pleura and peritoneum and around the kidneys. Death is often preceded by a hæmorrhagic broncho-pneumonia Fatal cerebral hæmorrhage has also been reported

It is now believed that onyalai is an acute form of thrombocytopenia due to nutritional deficiency The bleeding time is prolonged but the coagulation time is not increased There is an almost complete absence of platelets with severe anæmia

Treatment. This consists in correcting dietary deficiencies and the administration of large doses of bicarbonate of soda. Good results have attended blood transfusion and also auto-haemotherapy

Ulcus Tropicum. Aden Ulcer Yemen Ulcer, etc.

A chronic sloughing ulcerative process, which may become phagedænic, occurring in many tropical and sub-tropical regions, and often denoted by the name of the country in which it occurs.

Tropical ulcer is of great economic importance as it causes much disability in native labour in many countries. It was long held to be caused by a spirillar organism, *Treponema schaudinii* (Prowazek). E. C. Smith,



FIG. 51 "Tropical ulcer." (Reproduced by permission of the late Dr E. C. Smith.)

of Lagos, who studied the bacteriology however was of opinion that this organism though present, is not the essential factor There is a growing accumulation of information suggesting that dietetic deficiency is the predominant cause. Orr and Gilks found that phagedænic ulcer was much commoner in the vegetarian Kikuyu than in the Masai who subsist on milk and blood. Forbes-Brown, in Uganda, held that it was dependent upon environment, *e.g.*, it was rare in the better classes and better institutions. Similar observations have been reported from the Pacific Islands. Some striking observations were made by de Courcy Ireland, Hosking and Loewenthal in Teso, Uganda. They found that 4 per cent. of the Ajubulu, a vegetarian tribe suffered from tropical ulcer while their neighbours, the Opami, who subsisted largely on fish from the adjacent river swamp, were

free from the disease It is interesting to note that there was also a far higher incidence of another vitamin-deficiency phrynoderma xerophthalmia and night blindness in the vegetarian tribe

Histology The surface of the ulcer is covered by hyaline fibrin containing masses of the spirochaetes and bacteria. The sides and base of the ulcer consist of granulation tissue In the deeper parts there is an infiltration of lymphoid and plasma cells.

Clinical features The ulcers occur usually on the lower third of the leg and on the dorsum of the foot other uncovered parts being less commonly affected The ulcer is usually single The first stage of the lesion is a small painful papulo-pustule with a dusky infiltrated areola. Suppuration occurs and sloughing follows. The fully-developed ulcer is perhaps a couple of inches or more in diameter covered with a thick, dirty and very offensive secretion The base is red or pale and covered with flabby granulations. The centre is often funnel shaped There is very little pain. In some cases there is a phagedænic process and muscle tendon and bone may be exposed

The course is chronic and the ulcer usually lasts for months, showing no tendency to spontaneous recovery

Diagnosis. Tertiary syphilis and carcinoma are the conditions to be remembered in diagnosis A positive serological reaction may mean that the patient is suffering also from lues or yaws, and this will call for additional treatment Squamous carcinoma may be the result of chronic ulceration A biopsy of the edge will settle the diagnosis.

Treatment An obvious essential is a high protein diet Arsenicals administered intravenously have proved of value and calcium iodide has been recommended Complete rest of the affected limb is advisable Locally undiluted formalin should be applied once a day for 2 or 3 days This is followed by the application of a bismuth paste Good results have been recorded from the application of X rays and also from dressings of perchloride of mercury solution (1/1 000) peroxide of hydrogen permanganate of potash solution or an ointment of protargol, 5 per cent We have found pure Stockholm tar a useful application.

CUTANEOUS AFFECTIONS IN OTHER GENERAL DISEASES

Besides the avitaminoses there are many general and visceral diseases in which cutaneous eruptions occur As a general principle it may be stated that toxic conditions whether autogenous or heterogeneous may be accompanied by cutaneous lesions of the erythematous or petechial type and it is probable that many of the rashes met with in association with visceral disease are due to toxic bodies developed as a result of the impairment of the functions of the organs involved

Here it is not proposed to do more than indicate the chief forms of cutaneous affection met with in the general and visceral affections as many of them are dealt with in other parts of this work

DISEASES OF THE ALIMENTARY CANAL

The absorption of toxic bodies from the alimentary tract is a common cause of urticaria The toxins may be introduced from without or deve-

loped in the bowel by abnormal digestive process or fermentations of bacterial origin. Besides urticaria it is probable that many of the conditions classed as erythema own this cause Increased pigmentation may occur in cases of chronic intestinal stasis.

The gum rash of infants (strophulus or lichen urticatus) is probably the result of alimentary toxæmia but whether acting directly through the blood or through the nervous system is uncertain.

Rosacea is commonly associated with constipation and dyspepsia Some forms of eczema are believed to depend upon disorders of the alimentary canal and may respond to fasting a protein free diet or to colonic irrigation.

Oral sepsis must not be forgotten as a probable cause of erythema and purpura. One form of grave anæmia is associated with septic conditions of the buccal cavity and cutaneous hæmorrhages are sometimes associated with it.

Diseases of the lips and tongue. The differential diagnosis of diseases of the lips and tongue is so intimately bound up with general diseases that it may be advantageous here to list the more common affections. These are mainly dealt with elsewhere but we include a few of the rarer conditions.

In considering diseases of the lips we should consider the following —

(1) Lipstick and exogenic dermatitis and eczema.

(2) Lip biting and licking of nervous origin.

(3) Lupus erythematosus and lichen planus Leucoplakia of the lips

(4) Herpes, erythema multiforme pemphigus and dermatitis herpetiformis Aphthous ulcers are probably herpetic.

(5) Syphilis leucoplakia and cancer

(6) Vitamin and nutritional deficiencies including perlèche

(7) Pus-coccal and mycotic infections.

(8) Retention cysts of mucous glands including mucocele and Fordyce disease

(9) *Cheilitis glandularis* which is related to the above and presents numerous small cysts possibly provoked by trauma from the teeth. A muco-purulent exudate produces thick adherent crusts.

(10) *Cheilitis exfoliativa*.

A chronic scaly and crusted eruption occurring on the lips. It is difficult to place this disease the cause of which is unknown. It occurs most commonly in young women and is somewhat rare in men. It often lasts for several years

Cracks develop in the lower lip which bleed, and then dry and crust over Later the upper lip becomes affected. The characteristic features are black or brownish scales or crusts consisting of dried blood. Under the crusts the skin is dry and shrivelled In some instances this condition is succeeded by chronic scaling the scales on separating leaving a tender red glazed surface

The mucous membrane may be involved.

The usual soothing applications have little or no effect upon the eruption. Applications of radium and X-rays have occasionally cured the condition, but frequently the benefit is merely temporary

matous change and Kirch states that any blastoma may become xanthomatous from the deposit of cholesterol esters under the influence of an altered metabolism

Xanthoma may be associated with diabetes insipidus but this may be due as in a case described below, to a deposit in the pituitary body

Pathology The lesions lie in the dermis where the *foam cells* and the *Touton giant cells* are found The epidermis is normal or it may be pigmented The xanthomatous foci are rounded or in rows in the true skin and they are separated by bundles of collagen fibres Around the vessels there are large globular or fusiform cells with rounded nuclei containing granules or crystals doubly refractile under polarised light. These granules are also found between the cellular elements Chemically the material appears to be related to the fats being soluble in ether and melting with heat It can be fixed with osmic acid Sudan III stains it an orange red colour The substance is removed by fat solvents in the preparation of paraffin sections and the bubble like vacuoles remaining in the affected



FIG. 52 Xanthoma of diabetic type Male æt 24 The elbow and buttocks were affected.

cells account for their being called foam cells Pick has shown that the same substance is found in the blood and various organs of patients suffering from glycosuria and diseases of the liver He considered the special material as a deposit of unknown origin and independent of fat

Pollitzer holds that xanthelasma palpebrarum is in no way related to the xanthoma tuberosum It is in his opinion a peculiar degeneration of the muscles of the eyelid

Clinical features The lesions take three forms.

(1) **Xanthelasma palpebrarum.** Oval plaques of a wash leather or straw colour with a well-defined margin and very slightly raised above the surface occur on the eyelids The affection is not uncommon in adults and in old people It may be associated with cirrhosis and other affections of the liver, but the patients are often apparently quite well. The regions affected are the inner ends of the upper and lower eyelids close to the inner canthus. They are characteristic in appearance painless and free from itching (Plate 7) Xanthelasma may be associated with xanthoma tuberosum multiplex. Hypercholesterolæmia has been found in this variety of xanthoma

PLATE I.



XANTHELASMA PALPEBRARUM.

The washleather-coloured plaques are on each lid at the inner ends. The patient had also a rodent ulcer of the nose (partly treated and covered with lint) and a nævoid tumour on the upper lip.

[To face p. [illegible]

(2) Xanthoma tuberosum multiplex. The lesions are papules or nodules varying in size from a pin's head to a bean. Their colour varies most have a yellow tint, with perhaps an areola of pink, others have an earthy colour and others again are purplish, and the yellow colour can only be made out upon examination with the diascope They vary in consistence some being quite hard, while others are softish. The lesions develop slowly coming out in crops and progressing in size sometimes coalescing to form plaques They are symmetrical, the favourite sites being the elbows knees, shoulders knuckles buttocks and scalp Extensor surfaces appear to be preferred. Sequeira once saw a nodule on the prominence of the thyroid cartilage in a male who had an extensive outbreak on the hands and elsewhere

Plaques also occur on the eyelids and bands in the flexures and on the palmar and plantar regions

In a remarkable case shown by Dr Macleod there were irregular swellings of the wrist, elbow and knee-joints

Children and adults may be affected and both sexes are equally liable to the disease In the adult a history of jaundice is common. In a boy of seven under Sequeira's care in whom there were numerous small xanthomatous papules and nodules widely spread over the skin nodules were found in the viscera and one in the pituitary body To the last was ascribed the diabetes insipidus which was a prominent feature of the case Syphilis was excluded by the histology of the tumours and by repeated negative Wassermann tests.

Hypercholesterolemia has been found in xanthoma tuberosum multiplex.

Xanthoma diabeticorum is held by many authors to be essentially different from the preceding form. The lesions are pinkish or orange red papules, or nodules of small size. They come out acutely affecting the extensor surfaces of the limbs, neck loins and buttocks Sometimes they form rows and in one case the nodules resembled a string of yellow coral beads let into the skin about the knees. The nodules itch. The patients are usually middle-aged men, of stout, florid habit, and there is often a history of chronic alcoholism. Glycosuria is not always present, though it may appear after the eruption has cleared up Hypercholesterolemia has been demonstrated in cases under our care The papules and nodules may disappear in a few months, or occur intermittently

(3) **Xanthoma tumours** are seen occasionally they may be sessile, or pedunculated, and may reach the size of a small orange

Prognosis. Except in xanthoma diabeticorum, the tumours tend to persist.

Treatment of xanthoma. When xanthomatous lesions are inconspicuous they are best left alone. Xanthelasma palpebrarum often responds best to painting with 60 per cent. trichloracetic acid or a minute crystal may be applied for a short while to the centre of the lesion, which is surrounded by a protective zone of zinc paste until the skin becomes white over the yellow infiltrate Although excellent cosmetic results have followed this procedure in dark-skinned subjects the treated area may remain very pale and even more obvious than the original xanthoma.

X ray therapy may be used with caution, and a dose of 200 r given

every fortnight for three doses If improvement is not seen after two months the irradiation should not be repeated

Electrolysis may be tried on very small xanthomata but neither this nor freezing with CO_2 snow and local light therapy have given good results in our hands

Admirable results may be obtained by excision Of course no guarantee can be given that recurrences or new deposits will not arise after any form of treatment

The Dermatoses of Diabetes

The cutaneous complications of diabetes (and glycosuria) are important The underlying disease is not infrequently overlooked if attention is only directed to the skin Diabetes mellitus may be associated with xanthoma pruritus and eczema of the genitals furunculosis and carbuncle and with perforating ulcer (For diabetic gangrene see p 120)

Xanthoma diabeticorum usually occurs in severe cases when the diet contains a high proportion of fat The cholesterol in the blood is much increased and in some patients there is so much fat that the plasma looks creamy The treatment consists in cutting out eggs and most fats from the diet and giving an adequate amount of insulin A high carbohydrate diet and insulin occasionally cures xanthoma in patients who have no glycosuria (see previous page)

Pruritus and eczema of the **external genitalia** is common in diabetics of both sexes It is said to be due to the growth of torulæ and other organisms fostered by the sugar in the urine (Eczema however is rare in orthoglycæmic glycosuria even when there is 3 per cent of sugar in the urine (Leyton))

Eczema of the genitals usually subsides in about a week after the disappearance of sugar from the urine Treatment consists in wiping the urethral orifice immediately after micturition with a small sponge soaked in a saturated boric acid solution (The soaked sponge can be carried always in a waterproof bag) Irritation before the sugar has disappeared may be relieved by applying lead lotion

Pruritus vulvæ may occur without eczema in diabetic women Bathing with sodium bicarbonate solution (1 per cent) and the application of 1 or 2 per cent of phenol in lead or calamine lotion usually relieves the irritation. In our opinion the use of anæsthetic ointments is unwise

Furunculosis The diabetic is specially prone to infection by staphylococci but when boils occur in the subject of glycosuria attention to the major affection requires special attention because of the curious variations in the amount of sugar passed These variations in some way appear to be related to the absorption of toxins from the local lesions When the boils are numerous and large the patient should be put to bed He should be washed all over twice a day and there should be frequent changes of bed clothing and sheets Both sheets and clothes should be boiled to prevent re-infection When the patient is ambulant the underlinen should be fresh every day The best local application is a saturated solution of either magnesium or sodium sulphate in glycerine (*vide* p 456)

Carbuncle The necrosis which is characteristic of carbuncle (*vide* p 460) may start in the subcutaneous tissue and thus be independent of

want of cleanliness or trauma But four out of five carbuncles start at the nape of the neck, a part constantly irritated by the collar

It is said that 20 per cent. of the deaths from diabetes are due to carbuncle, but Leyton, who had an unrivalled experience in this disease maintained that physicians who avoided manipulation and surgical interference rarely see a case end fatally

Large and frequent doses of insulin may be required and it is recommended that the blood sugar be estimated twice daily once after the meal containing the most carbohydrates and the second four hours after the largest dose of insulin. To prevent hypoglycæmia Leyton advised that the estimate after the carbohydrate meal should not exceed 0·15 and that after the insulin should not fall below 0·08 milligrammes per 100 c.cm.

Perforating ulcer rarely develops except in cases of diabetes of long-standing The sole of the foot is affected and there may be neuritis as shown by absence of the tendo-Achillis reflex. Attention must be concentrated on the metabolic condition. A radiograph should be taken to see if the ulcer involves bone. Hypertonic baths are a helpful local measure. No operation on the ulcer not even the removal of thickened skin around it, should be undertaken unless there is a good pulse at the ankle.

Necrobiosis lipoidica diabeticorum is a rare dystrophy of the skin occurring in diabetes The condition begins as a red somewhat thickened area, usually about the dorsa of the feet or ankles or on the legs. Later the central part becomes pale and atrophic with a shiny yellowish surface resembling morphœa, but telangiectases and reddish spots mar the surface Apart from slight itching no symptoms are usually present. Extension is slow and a red margin surrounds the atrophic plaque Ulceration may occur

Histologically there is a chronic inflammatory process with giant cells, necrosis and peri-cellular fibrosis.

Gout. It is difficult to class any form of skin disease as definitely gouty Eczema appears in gouty subjects on slight or even imperceptible irritation but it is doubtful whether the presence of uric acid is of so much importance as the chronic intoxication from the alimentary canal. Acute gout may be confused with erysipelas, cellulitis or erythema pernio Chronic gout presenting cutaneous tophi demands consideration of other nodular lesions of the skin. The ureatic deposits may extrude through the skin and leave chronic ulcers. Lichen simplex and some forms of psoriasis have been associated with raised blood-uric acid.

Amyloidosis. Amyloidosis is familiar although becoming rare, in general medicine where it is regarded as a disorder of metabolism occurring in severe chronic infections, especially when suppuration is a persistent feature when some disturbance of protein metabolism leads to the deposition of amyloid in the walls of the smaller vessels, in the reticulum of adenoid tissue and in the pulp of the spleen The skin is usually spared in this type with the exception of its vessels and in the rare generalised exanthem, but it is involved in anomalous forms of localised amyloidosis which affect unusual sites The term "lichen amyloidosis" is given to one form.

Clinical features Amyloidosis may be generalised and arise as an exanthem of hard translucent, rather shiny papules or nodules with some pigmentation of the intervening skin. The induration and small areas

of atrophy may simulate scleroderma or exhibit a lichenoid appearance The prognosis of the generalised form is grave because it is a manifestation of a wide systemic involvement Localised amyloidosis is naturally of less serious significance In appearance the lesions may be as above described and like them give rise to no symptoms but hypertrophic lesions occur as nodules or warty masses of various sizes Pigmentation and hyper keratosis may obscure the clinical picture unless a clue is found in the translucency of solitary peripheral nodules, which may however resemble sarcoid Pruritus is usually intense and persistent in the latter variety so that the lesions are taken to be hypertrophic lichen simplex or verrucose lichen planus and the real diagnosis is only revealed after a biopsy Treatment is unsatisfactory

Calcinosis cutis *The deposition of calcium in the skin may depend* entirely upon local factors or result from an increase of calcium in the blood as a metabolic disorder or from the destruction of bone Calcium salts are sometimes found in the areas of caseation of tuberculosis including lupus and in many chronic inflammatory lesions especially in old ulcers. Whenever fat necrosis occurs calcium salts of the fatty acids are likely to form so that calcium deposits are found in erythema induratum and in sclerema neonatorum they also occur in pseudo-xanthoma elasticum in scleroderma and sclerodactylia and in Raynaud's disease In the above described conditions the calcium deposits are features of the histology Clinically calcinosis cutis is manifest by the appearance of slowly growing deposits of lime salts in the skin which form bony hard papules nodules or tumours over which the skin may become so stretched as to necrose and lead to ulceration and extrusion of calcareous masses

Calcinosis cutis circumscripta Small nodules usually arise on the hands and about the joints more or less in the distribution of gouty tophi Larger nodules have been seen in the scrotum In calcinosis universalis larger deposits occur as plaques and may be followed by chronic ulceration. When more generalised in the skin and connective tissues deposits have been seen in the sweat glands and in cells of the epidermis This variety has been termed metastatic calcinosis cutis

We have seen calcinosis occur in patients with acrocyanosis

Sclerema Neonatorum

(Gk *skleros* hard)

(Sub-cutaneous fat necrosis Adiponecrosis subcutanea neonatorum Cytosteatonecrosis of the subcutaneous tissue of the new born Lipophagic granuloma)

This condition is a rare affection of the skin which invariably occurs at birth or within the first few weeks of life The condition was first differentiated by J W Ballantyne (1895) since when its recognition has been retarded by confusing nomenclature and we are indebted to A M H Gray (1933) for an enlightening and critical survey

Sclerema neonatorum is characterised by the gradual and symmetrical development of sharply defined areas of induration in the subcutaneous tissue affecting chiefly the calves of the legs buttocks scapula and deltoid regions and cheeks

Etiology The essential feature is a gradual progressive solidification of the subcutaneous fat. Analysis has revealed diminution in the olein content of the affected fat, as a result of which the melting point of the fat is disproportionately raised, and the palmitin and stearin form crystals in the fat cells. A fall of body temperature would no doubt accelerate the deposition of fat crystals but this is not an essential factor Apparently the presence of the crystals stimulates an inflammatory reaction in the supporting connective tissue and accounts for the appearance of foreign body giant cells Harrison has shown that saponification does not occur in the early stages of the disease and this distinguishes it from pancreatic and traumatic fat necrosis. The condition must be regarded as an obscure metabolic disorder not definitely related to cold or trauma.

Diagnosis. *Sclerodermia* although very rare in newly born infants differs in no respect from the disease which is more commonly seen in adults. *Preagonic or cadaveric induration of the cellulo-adipose tissue* to use Ballantyne's full title, is a very rare condition which occurs not only in infants within the first few weeks of life, but also later In this condition there is a rapidly developing solidification of the subcutaneous fat tissue of the whole body occurring just before death in infants enfeebled by existing diseases, of which diarrhoea is the most common. The temperature is always subnormal, and may fall as low as 90 or even 80 F The lower limbs are usually first affected, the induration spreading upward and becoming universal In this condition analysis revealed no abnormality of the fat although it was shown by Langer that the fat of the newly born child normally contained a smaller percentage of olein than adult fat, which probably accounts for the solidification which occurs so suddenly and universally in the condition of preagonic induration, described above.

Œdema neonatorum is a true oedema unassociated with pathological changes in the subcutaneous fat. As in adults, infection and toxaemia are potent causes. The infants are often premature, and cardiac, renal and pulmonary affections have been reported. The infant is debilitated, listless and sleepy with feeble pulse and respiration. The oedema usually begins on the lower extremities and spreads to the body The skin is dull red, bluish or mottled, and feels doughy pitting on pressure at first, finally becoming tense Recovery is extremely rare

Treatment of sclerema neonatorum is directed to improving nutrition and conserving body heat.

Reference.—A. M. H. Gray 1933, *Brit. Journ. of Derm. and Syph.*, Vol. XLV p. 498.
For starvation oedema and dermatoses of profound malnutrition see p. 109.

ENDOCRINE AFFECTIONS

The nutrition of the skin and its appendages is largely influenced by the endocrine secretions They appear to act (1) directly or (2) indirectly through the nervous system.

Thyroid. *Hyperthyroidism*, as in Graves's disease, is attended with dyschromias. There may be melanodermia or leucodermia or both. Flushing and excessive sweating are common symptoms. Itching of the skin is of frequent occurrence *Urticaria* and purpura are sometimes met and oedema is not infrequent. There may be excessive growth of hair and occasionally dystrophy of the nails. Circumscribed myxomatous

degeneration occurs as nodules or plaques on the legs and associated with hyperthyroidism (Ingram 1033) Alopecia areata may occur

Hypothyroidism In myxoedema and cretinism the skin is usually dry and harsh the hair tends to fall out and there may be dystrophy of the nails In Lorain's infantilism due to hypothyroidism there may be universal alopecia (*vide* p 188) Eczema is prone to develop

Pituitary *Hyperpituitarism* In acromegaly the skin and subcutaneous tissue are thickened the pores are enlarged and the sebaceous glands are hypertrophied Hyperidrosis of the whole surface may be troublesome and *intractable The greasy skin is associated* with an unpleasant odour The hair is *abundant coarse and wiry*

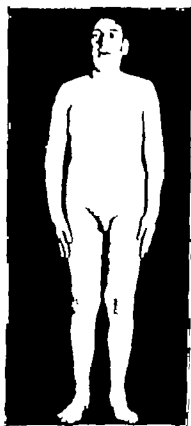


Fig 53 Hypopituitarism following injury to base of skull Male æt 20 Photograph kindly lent by Dr Cecil Wall

Hypopituitarism In this condition the skin is smooth and transparent and free from moisture The pubic and axillary hair is absent (Fig 53) In *Simmond's disease* anterior panhypopituitarism, the pubic hair is lost

It should be noted here that a similar symptom occurs in diseases of the hypothalamus due to increased intracranial pressure trauma tumour encephalitis etc *and may be associated with universal* alopecia These facts suggest a close con*nection between the hypothalamus and the* endocrines

In *Cushing's syndrome* the hair falls out over the vertex temporal and frontal regions There is hypertrichosis of the upper lip and beard regions and on the thighs legs forearms chest and abdomen The pubic hair extends in a triangle to the umbilicus *Lineæ distensæ due to adiposity are seen on the lower abdominal mammary and axillary* regions They may be wide and of a dusky *red colour rather than white*

In *Fröhlich's disease* the skin of the back and upper arms and the outer sides of the shins is reddened The patients bruise very easily There are large lineæ distensæ

In *Dercum's disease* there are painful fatty tumours especially of extremities and trophic ulcers may occur

Adrenals. In adrenal dystrophy usually tuberculous as in Addison's disease excess of pigment in the areas normally pigmented is a characteristic feature The dyschromia *is also present in the mucous membranes* There is evidence that vitamin C is necessary for normal functioning of the adrenals *If the vitamin be deficient* excess of pigment may appear in the skin and this excess can be relieved by treatment with ascorbic acid (p 88)

In *adrenal hypertrophy* particularly where there is a malignant hyper

nephroma, the patient, usually a child, shows among other symptoms of precocious puberty an excessive growth of pubic and axillary hair

The meningococcal adrenal syndrome is dealt with under "Purpura" (p. 260).

Thymus. In thymic dwarfism the hair is scanty and the skin generally dry and scaly Pigmentation of the scalp has also been described.

REFERENCE.—J T INGRAM, 1933, *Brit. Journ Derm and Syph.*, 45, 19

Ovaries. Rosacea and a wide variety of erythematous eruptions occur in connection with pregnancy the menopause after the removal of the ovaries and in some diseases of the female genital organs Urticaria occurs in pregnancy and in rare cases an extensive bullous eruption, hydroa gravidarum, develops The rare disease known as impetigo herpetiformis appears only in the pregnant woman. Chloasma uterinum is a peculiar pigmentation of the face met with in pregnancy Civatte s type of poikiloderma may occur (p 374). Fall of hair is not uncommon in the later months of the puerperium or during lactation Pruritus of the external genitals may be a symptom of disease of the uterus or ovaries

Keratodermia climactericum is a localised hyperkeratosis of the palms and soles.

Chloasma. This term has been applied to a number of varieties of pigmentation of the skin The lesions resemble freckles, but are larger macules and although light intensifies the pigmentation, the primary cause is either obscure or depends upon some endocrine disturbance The latter etiological basis is indicated in the term chloasma uterinum about to be described, but the condition called poikilodermia of Civatte in which the freckling is reticular and more apt to affect the sides of the face than the central part was no doubt included in chloasma uterinum and also cases of Riehl s melanosis.

Anderson and Wernoe (1930) have described a similar type of pigmentation with circinate brownish rings on the forehead associated with some cutaneous dystrophy and pigmentation of the linea alba in patients with encephalitis brain tumours, or organic brain injury It is possible that further sub-varieties of facial pigmentation will be differentiated and removed from the non-specific group which is now termed chloasma.

Chloasma uterinum is a pigmentary discoloration of the face and rarely of other parts occurring in pregnancy and occasionally in uterine and ovarian disease and prone to occur at puberty and at the menopause. Several varieties of peribuccal pigmentation in women and young girls have been described by Brocq and Poor and these also appear to be partly dependent upon endocrine factors—in seborrhoeic subjects.

Etiology The affection is related in some way with the female genital organs and has been variously ascribed to a toxæmia and to irritation of the sympathetic nerve centres in the abdomen.

Clinical features Patches of a yellowish or brownish tint and of irregular outline appear on the forehead, temples, cheeks, and rarely on other parts of the face and trunk. The linea alba the vulva, and the areolæ of the breasts are pigmented at the same time especially in brunettes. Chloasma develops in pregnancy and persists until menstruation returns

or even longer It sometimes occurs in association with disease of the uterus and of the Fallopian tubes

The condition may be confused with the reticular pigmentation affecting the sides of the face in poikiloderma of Civatte (see p 274) which also may be due to some ovarian deficiency

The melanosis of Riehl and tar melanosis somewhat resemble Civatte's poikiloderma Berlocke pigmentation (p 311) may lead to confusion

Treatment is unsatisfactory

In rare cases a chloasma similar to that met with in pregnancy etc occurs in tuberculosis of the peritoneum and in malignant disease of the abdominal organs

Dermatitis symmetrica dysmenorrhoeica occurs in women with dysmenorrhoea and is believed to be due to toxic metabolism from ovarian derangement *The patients often suffer from cardiac and psychic disturbances.* The eruption is symmetrical and affects the limbs face and front of the trunk The lesions are urticarial at the onset and later vesico-bullous. They become crusted and leave stains Models suggested self production, but this is said to have been excluded (Matzenauer and Polland *Archiv f Dermatologie* October 1912 p 185)

Lichen Axillaris (Fox-Fordyce Disease)

This rare affection is characterised by pin head sized, circular dome-shaped itching papules affecting the hairy parts of the axillæ and pubes

The patient depicted in the illustration (Fig 54) was a neurotic woman and nearly all the cases described have been in females between the



Fig. 54 Fox Fordyce Disease The axillæ of a girl æt 20.

ages of fifteen and forty-eight the majority being in the second and third decades. The eruption is uniform the elementary lesion being a dome-shaped papule 1 5 mm. in diameter slightly darker than the normal skin The papules may be closely set but they do not form plaques like lichen planus. Both axillæ are involved, and sometimes also the pubic area and the region round the umbilicus There is intense itching Histologically the lesions consist of a hypertrophy of the prickle-cell layer around the epidermic portion of the apocrine glands Acanthosis, hyper keratosis (less marked parakeratosis) are seen, particularly in and around the hair follicle and ducts of the apocrine glands which open either into the hair follicles or very near them into the surface of the skin. These changes lead to blocking widening of the ducts inflammation of the gland, degeneration and breaking of the hair There is lymphocytic, and also mast cell infiltration not only in the region of the apocrine glands but also of the ordinary sweat glands, penetrating the walls and destroying the functional cells. Papillary and subpapillary œdema occur The inflammatory reaction about the opening of an apocrine gland into a follicle appears to indicate that the secretion of the gland is abnormal and the usual increase of irritation at the menses supports the hypothesis that the disease is a functional one of endocrine origin. Improvement after treatment with ovarian hormone confirms this view

Treatment. Stilboestrol 1 mg once or twice a day or ovarian follicular hormone should be given. A sedative may be necessary to relieve irritation. Locally X-rays 100 r to the areas repeated at two weeks intervals for 3 or 4 doses are often useful A lotion of —

Phenol. liq., ℥x.
Sp. meth. indust. ʒii.
Liq hydrarg perchlor ad ℥i relieves irritation and prevents sepsis after scratching

Kraurosis vulvæ

(Gk. *krauros* dry)

An atrophic condition in the vulva, with stenosis of the orifice.

Etiology Kraurosis vulvæ occurs in sterile young women, after the menopause and after oophorectomy It probably therefore, is dependent upon deficiency of ovarian hormone.

Pathology The epithelium is thinner than normal and the papillæ atrophy There is infiltration of plasma cells, lymphocytes, and poly morpho-nuclear leucocytes under the flattened epithelium. The elastic tissue is present in the sub-epidermal layers.

Clinical features. The labia minora, the vestibule the orifice of the urethra, and the vagina are affected. The lesions do not spread to the perineum and thighs Two stages are described. In the first the muco-cutaneous surface is red and shiny and dotted over with bright red spots the size of a pin s head or larger There is usually a caruncle at the meatus urinarius. In the second stage the area becomes of a pale yellow colour with a glistening surface, which has been likened to the surface of a fatty liver The muco-cutaneous junction is smooth, and all the ridges disappear; the labia minora and clitoris atrophy and the mons veneris wastes.

The patient complains of soreness and pain. There is pain on micturition and dyspareunia. In the second stage these symptoms disappear. *There is no tendency to malignant formation.*

Treatment. High doses of œstrogen are required. Three to four weeks treatment by stilbœstrol or œstrogen in 5 mg doses daily usually relieves the patient for a year to eighteen months. Another method is to insert a pellet of œstrogen subcutaneously and remove the remains after one to two months. Uterine hæmorrhage may be caused by such high dosage but is not a contra indication.

Kraurosis penis. Stuhmer 1928 described as "balanitis xerotica obliterans" a chronic progressive atrophic sclerosing condition of the glans and prepuce. It appeared to be analogous to the vulval disease. Smooth white atrophic areas of sclerotic bands slowly constrict the prepuce or produce stenosis of the meatus. The lesions are usually confined to the mucous surfaces. *Treatment has little effect unless the patient responds to orchitic hormone.*

Other Endocrine Affections

Acne vulgaris (*vide* p. 210) in some cases in both sexes is benefited by the administration of the œstrogenic hormone. A safe dosage is 1 mg. of stilbœstrol for boys and ½ mg. for girls daily for six to twelve weeks.

Endocrines and the hair. Sex hormones have a definite influence upon the growth of the hair. There is a marked dissociation between the development of the scalp hair and that of the face and pubis. Complete castration before puberty renders the face and the pubic region almost or completely hairless, while there is abundant growth on the scalp and this is retained throughout life.

Virile men with full sexual potency may become completely bald, and *women who have developed male characters also lose their scalp hair.* The withdrawal of the ovarian secretion in elderly women or in those who have had a double oophorectomy is often attended by hypertrichosis of the face.

We have already referred to the influence of adrenal and pituitary hormones on the growth of hair (p. 104). The effects of vitamin deficiency *are considered at p. 86.*

Scalp ringworm has been treated with success in children by the administration of hormones. The rarity of tinea capitis in adults and the tendency to spontaneous cure at puberty suggest the influence of a hormone. *It appears possible that this might act on the pH.* Pothi and Kalisky treated 30 children suffering from scalp ringworm with œstrone (5,000 international units *daily*) or diethyl-stilbœstrol 1 mg. (75,000 I.U.) a day and inunction of œstrogen. No other local treatment was employed. Twenty four of the 30 children were clinically cured in from four to nine weeks. The remaining *four had discontinued* attending. Two small girls had vaginal bleeding which subsided with the cessation of treatment.

The senile skin. Evidence has accumulated that *the changes which* characterise the senile skin are largely due to absence of the *hormones secreted* by the sex glands. The senile skin is dry, often generally or patchily pigmented especially of parts exposed to sun. *It is thinner than* normal and has lost its elasticity. If pinched up into a fold the fold persists. Histologically the stratum corneum and *stratum granulosum* are

unaffected, but the germinal layer is thinned and stains poorly The rete pegs are flattened as are the papillæ The collagenous bundles are swollen and the elastic tissue is diminished These conditions are found in cases of senile pruritus

Treatment of senile pruritus In the *female* œstrogen propionate injected hypodermically in 1 mg doses will relieve the pruritus. But it always recurs Symptomatic relief follows another dose Repeated doses have the disadvantage that they may cause painful nipples and hæmorrhage from the uterus. These untoward symptoms can be suppressed by injections of testosterone with the œstrogen.

In the *male* testosterone propionate in 10 mg doses has a decided effect on the pruritus. Here again, recurrences are usual and are relieved by fresh medication. A more prolonged effect can be produced by injecting 20 mg of the propionate subcutaneously

After treatment on these lines the histological picture changes. The œdema of the cutis disappears and the affected cells stain normally There is no alteration in the number or character of the elastic fibres

Eunuchism. Sabouraud has confirmed the old observation that eunuchs do not suffer from the common masculine type of baldness. As a rule the scalp and pubic hair approach the female type.

Slow Starvation. The conditions in China during the past years have given opportunity for the study of the effects of slow starvation. Laycock noted that the earliest symptom was œdema of the feet, which ultimately became widespread The skin had a bluish tint and later became glazed. Multiple fissures developed and from these there was a serous discharge. Secondary infection was followed by hæmorrhagic blisters, and gangrenous ulcers formed mostly on the dorsal surfaces of the feet in neglected cases. Extensive œdema of the legs as high as the popliteal spaces prevented flexion of the knees. Eczema of the genitals and scrotum the face and the backs of the hands was common. Oral sepsis was frequently observed, but the tongue remained clean and moist.

A high protein diet, liver meat, fish soya beans and vitamins rapidly cured the vast majority Fatal results were associated with albuminuria.

REFERENCE—H. T LAYCOCK (1944), Brit. Med. Jour i, 667

Acanthosis nigricans

(Gk. *akanthos*, thorn)

A very rare disease commonly associated with abdominal cancer characterised by itching warty growths upon the skin and pigmentation.

Etiology Two types of the disease are recognised, though their relationship is obscure (1) A benign juvenile dermatosis which is associated with general well-being or with congenital malformations, peritoneal adhesions etc. and (2) the vast majority in which grave cachexia due to carcinoma, sarcoma and rarely diabetes are prominent features In this type the patients are chiefly women between thirty five and fifty years of age In the majority malignant disease of the alimentary tract or the female genital organs is present. In some instances the cutaneous condition has been the first evidence of malignant disease

It has been suggested that the dermatosis is caused by (1) a lesion or dysfunction of the abdominal sympathetic system, but it has been seen in

association with cancer of the lung and Wise saw it in a woman aged twenty five after decapsulation of the kidney (2) Toxæmia from malignant growths tuberculosis or syphilis and exposure to sunlight (3) A third hypothesis is that the chief factor is involvement of the adrenals by tumours or dysfunction of those organs (4) Finally it has recently been suggested that acanthosis nigricans is the evidence of a grave avitaminosis Hollander reports relief from treatment by large doses of vitamin B complex.

Histology The cutaneous changes are hypertrophy of the horny and granular layers of the epidermis and prickle-cell layer The papillæ are elongated by the downgrowth of the interpapillary processes The pigment is in the form of granules in the deep layers of the epidermis



FIG 35 Acanthosis nigricans. (Block kindly lent by Prof Wild of Manchester)

Clinical features The skin generally is of a greyish-brown tint The warty excrescences occur symmetrically and affect the back of the neck and the peri-anal and genito-crural regions most commonly but the axillæ umbilical region the bends of the elbows the mammary region and the hands and feet are involved to a greater or less extent Warty growths also occur in the buccal cavity but the mucosa is not pigmented The pigmented skin varies in colour from a greyish brown to a dark brown or even black tint It is somewhat thickened and the surface is rugose from the exaggeration of the normal fissures There is no scaling but in the flexures particularly the regions mentioned above there are isolated warty excrescences or groups of warts varying in size from elevations just visible to the naked eye to lesions as large as a small pea The skin of the hand is commonly warty and pigmented the nails are brittle and there is often considerable loss of hair The warts are not painful but there may be some itching occasionally severe The onset is usually insidious the patient first noticing the darkening of the skin in the axillæ or about the neck, or the development of one or more warts In some instances itching has preceded any obvious change in the integument

The course of acanthosis depends upon the activity of the malignant process but the prognosis is always very grave

The **diagnosis** of an advanced case is not difficult The affection which most closely resembles acanthosis is Darier s disease which usually begins early in life and affects males more than females The pigmentation is not so marked in Darier s disease the scalp is usually affected and there are peculiar histological changes (dyskeratosis) The pigmentation might suggest Addison s disease but the presence of warty growths is sufficient to distinguish acanthosis nigricans

Treatment. Unless the primary cause can be removed by operation nothing satisfactory can be done Supra renal extract has been suggested

by Boeck. Thyroid extract is also recommended. Sedative and antipruritic lotions may be necessary to relieve itching or superficial X-ray therapy Full doses of the vitamin B complex might be tried

ORGANIC NERVOUS DISEASES

Dermatalgia and erythromelalgia. *Dermatalgia.* In a few rare cases there is a peculiar condition of the skin which has been called dermatalgia. The affection is a local one and often located in the hairy parts. The only symptom is spontaneous pain which may be associated with hyperæsthesia but the skin appears to be normal. Referred pain and tenderness of the skin secondary to reflexes from visceral disease must be carefully excluded Causalgia is distinguished from dermatalgia by neurotrophic changes giving rise to glossy skin

Erythromelalgia is a related phenomenon but the characteristic features are pain and patches of erythema The pain is acute, and of a throbbing burning, or darting nature and it usually affects the lower limbs particularly the feet but occasionlly the hands, and rarely the face, are involved. A dependent position and warm temperature aggravate the symptoms.

Erythromelalgia occurs in a number of nervous diseases viz. tabes disseminated sclerosis, myelitis and syringomyelia, and peripheral neuritis Occasionally Raynaud's disease, or phenomena indistinguishable therefrom, co-exists In some cases there is no obvious cause. Gangrene of a finger has occasionally occurred.

A spurious type of erythromelalgia may occur in cases of *thromboangitis obliterans* which is almost peculiar to Polish Jews The skin affection is characterised by redness or cyanosis, with intermittent attacks of pain in the sole The affection is bilaterally symmetrical, and the colour does not fade on pressure.

The treatment of these conditions depends upon the cause: blisters have been applied over the segment of the spinal cord, whence the affected parts are supplied, but other cases have been relieved by the administration of phenacetin and antipyrin. Aceto-salicylic acid might also be tried. The local application of menthol has also been recommended. The affection may be exceedingly chronic, but in some cases clears up spontaneously in a few weeks.

High frequency therapy is sometimes effective either locally or applied over the corresponding segments of the spinal cord. Small doses, 50–100 r of X-rays may relieve the pain.

Atrophodermia neuritica. Glossy skin. Glossy skin is an uncommon affection, characterised by smooth, glossy patches on the extremities, following injury or disease of a nerve.

Etiology Atrophodermia neuritica follows injuries to nerves in which there is incomplete solution of continuity or neuritis following a wound. The wars have furnished many opportunities of observing this condition and the associated causalgia (thermalgia) caused by bullet wounds of nerves. It has also been observed in gouty neuritis, in anæsthetic leprosy and after herpes zoster and rarely in chronic diseases of the spinal cord.

Clinical features The extremities are usually affected, commonly the fingers The skin is dry smooth, and glossy and of a pink or red colour

or mottled The appendages suffer also the parts are denuded of hair there is usually an absence of perspiration though occasionally excessive sweating has been noticed and the nails undergo peculiar and distinctive changes The common condition is excessive curving of the nails both in the transverse and longitudinal directions and whitlows are frequent A specially important feature of this form of atrophy of the skin is intense pain causalgia (thermalgia) described as burning which precedes the changes in the skin and persists Glossy skin tends to spontaneous cure and the treatment consists in protecting the surfaces from cold and injury The local application of cold water usually relieves the pain if this fails very hot water should be tried

Morvan's disease Syringomyelia. The cutaneous conditions occurring

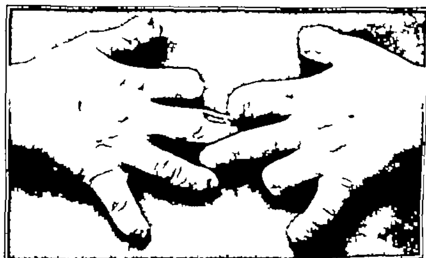


Fig 36 Syringomyelia showing deformity of hands. (Case under Dr Henry Head)

in this rare affection require notice in this place on account of their similarity to the lesions of nerve leprosy

The disease begins sometimes in childhood but usually between the ages of twenty and fifty and it is commoner in the male than in the female. The onset is insidious with pain in the extremities which is followed by analgesia affecting first one side and then the other In some cases the loss of sensation is an early in others a late feature The next and perhaps the most characteristic phenomenon is the development of whitlows usually painless but occasionally attended with great pain and tenderness when occurring in the early stages The fingers are most commonly affected but similar lesions appear on the toes The inflammation about the terminal phalanges involves the bones and necrosis occurs the terminal segments of the digits falling off leaving mutilated stumps In the photograph, kindly lent by Dr Henry Head the mutilations are well shown. The skiagram of the same case shows complete disappearance of the terminal phalanges in some fingers and partial atrophy in other digits Large bullæ sometimes containing blood may form upon the affected skin and ulceration also occurs As in other forms of trophic

disturbance, the peculiar form of atrophy known as "glossy skin" develops in Morvan's disease.



Fig. 57. "Trophic ulcers" in a case of anterior polio-myelitis.

The muscular weakness is followed by atrophy and the contraction of the fingers leads to the formation of a claw hand, "main en griffe." There is retention of the sensation of touch, but loss of sensibility to heat and cold, and this feature is an important means of distinguishing Morvan's disease from nerve leprosy. It has, however, been shown that syringomyelia may develop in leprosy and the thickening of the ulnar and other nerves must be looked upon as the most important diagnostic feature, in the absence of the recognition of the bacillus lepræ. In the mixed cases of lepra there is usually no difficulty in making a diagnosis. Morvan's disease lasts for many years; there may be remission of the symptoms from time to time, but the destructive process is slowly progressive, and treatment is of no avail.

Trophic ulcer (Gk. *trophe* nourishment). Trophic ulcers are occasionally met with in the limbs of children affected with anterior poliomyelitis. The muscles are wasted



Fig. 58. Perforating ulcers. Three years duration.

[illegible]

the skin cold and purplish in tint and one or more chronic indolent ulcers form chiefly as the result of the impaired circulation with secondary sepsis Fig 57 represents a characteristic case

The treatment consists in *keeping the limb* warm by wrapping in cotton wool and dressing the ulcers with an antiseptic and stimulant ointment

Perforating ulcer A chronic ulceration of limited area, occurring usually on the soles of the feet in the subjects of tabes dorsalis diabetes, peripheral neuritis leprosy and syringomyelia (Fig 58)

The seat of election is over the head of the metatarsal bone of the great toe or on the heel *i.e* parts exposed to pressure Both feet may be affected and the *perforating ulcers may be multiple* *Rarely similar ulcers* occur on the fingers and on the dorsum of the foot

A painful thickening of the skin appears first and upon this a bleb may form and ultimately a slough Under the slough is a rounded ulcer with raised thickened edges The necrosis may involve the tendons and even the bones or open the joint The ulcer is usually anæsthetic but there may be tenderness on pressure

Treatment. The affected part must be kept at rest A salicylic acid plaster may be applied to soften the thickened skin and the area is then fomented Curetting of the surface followed by antiseptic dressing may also be tried As a rule the ulcers heal but in severe cases surgical interference becomes necessary

Psychoneuroses

Apart from the cutaneous affections which occur in relationship with organic disease of the nervous system a number of eruptions appear to be determined by acute nervous shock violent emotion and anxiety Among these may be mentioned fall of hair and changes in its colour some eczemas lichen simplex lichen planus urticaria dermatitis herpetiformis the acute variety of lupus erythematosus and pompholyx (dyskidrosis) In hysteria eruptions are often produced artificially but in rare cases it is believed that the skin affections develop spontaneously Œdema and gangrene have been observed These are dealt with under their appropriate *headings*

Diseases of the Blood

In *pernicious anæmia* the skin has a peculiar lemon tint and sometimes cutaneous hæmorrhages occur Sequeira had a case which was associated with intense pigmentation of the whole skin and complete loss of hair

Microcytic anæmia may be associated with cracked angles of the mouth, angular stomatitis koilonychia and often some soreness of the tongue and mouth (superficial glossitis) The Plummer Vinson syndrome is associated with leukoplakic patches about *the tongue and mouth*, throat, etc which may go on to carcinomatous change

The cutaneous manifestations of leukæmia are described on p 141

CUTANEOUS ERUPTIONS IN GENERAL INFECTIONS

Acute Specific Fevers

The eruption may be :—

(1) A special feature of the disease as in the exanthemata

(2) A minor feature, but yet of diagnostic importance *e.g.*, the rose spots of typhoid the petechiæ and dusky mottling of typhus, and the petechiæ, mottling rose spots erythema, and herpes of cerebro-spinal meningitis (Rolleston found rashes in more than half the cases of C.S.F Herpes occurred in 23 per cent) ;

(3) An inconstant symptom, *e.g.*, the erythema and petechiæ of diphtheria, the morbilliform and scarlatiniform erythemata of influenza, the herpes of pneumonia, the erythemata and purpura of acute rheumatism.

Septicæmia and pyæmia. Rashes of erythematous and petechial types occur in many cases of septicæmia and pyæmia, including infective endocarditis and miliary tuberculosis.

Skin Eruptions in the Tropical Fevers

Eruptions of erythematous and petechial types occur in a number of the fevers met with in the tropics With the exception of dengue and typhus the rashes are of little diagnostic importance and in the majority the diagnosis depends upon other symptoms The following *résumé* indicates the chief features.

Cerebro-spinal fever The early occurrence of cutaneous hæmorrhages which is almost a constant symptom in this disease in temperate climates (p. 265), is rare in East Africa (Jewell and Kauntze)

Cholera. Erythematous and purpuric rashes are frequently observed. The asthenic conditions may be accompanied by bedsores and gangrene. Furunculosis is a common sequel.

Dengue. An hour or so after the onset of the fever and the severe muscular and articular pains an erythematous rash (the primary rash) appears mostly on the face and the limbs It closely resembles the eruption of scarlet fever and rarely lasts for more than twenty-four hours The temperature commonly reaches the normal on or about the fifth day the defervescence being accompanied by free sweating, polyuria and diarrhœa. A day later the temperature rises again for a short period, the pains recur and almost invariably the characteristic rash appears. It begins on the palms and backs of the hands and spreads to the arms thighs and legs Two types may be recognised one closely resembling measles, and the other which consists of minute bright red points like scarlatina but tending to coalesce into large areas. A furfuraceous desquamation follows Patients have complained to us of intense itching a feature not specially mentioned in text-books

The Enteric Group. Occasionally there is a fleeting scarlatiniform eruption which precedes the development of the sparse pink papules which come out from the seventh to the tenth day In the paratyphoids the eruption is sometimes profuse and the spots are larger and have a bluish tint which does not entirely disappear on pressure Bedsores and

gangrene may occur in severe cases and furunculosis is a not uncommon sequel Alopecia is comparatively frequent and may be permanent.

Kala-azar (visceral leishmaniasis) The *Leishmania donovani* may cause an acute subacute or chronic affection. There are irregular pyrexia, enlargement of the spleen and liver with grave anaemia and cachexia Various types of rash are met with, but the most interesting are papules which may pass on to ulceration These occur chiefly on the thighs and scrotum The organism may be found in the pus Petechiae of the skin and epistaxis are not uncommon The hair often falls

Acton and Napier have studied the post kala azar affections of the skin In the first stage there is depigmentation and the microscope shows proliferation of macrophages about the sweat glands and the vessels of the corium A second stage shows nodules formed by granulomatous masses in the subcutaneous tissue *Leishmania* may be found in the macrophage cells In very chronic cases raised painless reddish yellow plaques may occur These contain the parasite but do not ulcerate

Leptospirosis This widely spread disease has many names. The out break of *spirochaetosis icterohaemorrhagica* during the 1914–18 War attracted much attention Cases of Weil's disease occasionally occur in temperate regions notably in Jewish immigrants in the United States.

Herpes labialis is often seen at the onset of the illness and in Europeans the vesicles may be haemorrhagic In the more severe cases petechiae may accompany the jaundice Morbilliform erythematous and papular rashes have been observed

Malaria Some of the text books describe a "herpetic" variety of malaria Labial and other varieties of herpes occur with the fever and in *the recurrences the outbreaks usually return in the same site* Sequeira described the case of a patient who had recurrent gluteal herpes His first and second attacks of subtertian fever were both attended with outbreaks *of herpetic vesicles in the same sites The eruption is due to the activation* of latent virus (p 018)

Pappataci fever, sandfly fever This three-day fever probably caused by a *virus inoculated by sandflies may be attended with several types of* eruption the most characteristic being a subcuticular mottling of the chest and abdomen

Plague. *In the bubonic variety the skin over the bubo may become* gangrenous and slough Necrotic areas may occur in other parts. Purpura may be a noteworthy feature and this was especially marked in the *Black Death* of the *Middle Ages In grave cases pustules* and carbuncles containing plague bacilli may occur In Cuyaquil cases have been described which resembled small pox.

It is said that *labial herpes does not occur in pneumonic plague* This point may be useful in the differential diagnosis of lobar pneumonia

Rat-bite fever The *Spirillum minus* is introduced by the bite of the rodent. The wound *has usually healed by the tenth day* when there is a sudden onset of fever with pain and tenderness at the site of infection. Blebs form and the regional lymphatic glands become swollen and tender A purplish papular rash appears *on the chest and upper extremities* This fades during the apyretic periods but can usually be made to reappear by the application of heat. Areas of hyperaesthesia and oedema on the

extremities are common The spirillum can be found in the blood by dark ground illumination A single dose of 0·4 to 0·6 gram Novarseno-benzol usually effects a cure. All rat-bites should be cauterised as a preventive measure.

Relapsing fever An eruption of rose-red spots appears occasionally on the neck, the sides of the trunk, the inner aspects of the thighs and the forearms. Petechiae are rare.

Tropical typhus. While epidemics of typical louse-borne typhus occur in the tropics a much commoner and more benign condition is met with. Europeans are often attacked. "Tropical" typhus is widely spread and is described under different names in different countries A comparative study will be found in *The Journal of Tropical Medicine and Hygiene* for October 1930

The eruption comes out about the fourth day of the illness (2nd to 7th day in different areas). It is usually general and includes the palms and soles. It is maculo-papular roseolar to rubeolar Petechiae are rare. *Brown staining* is left by the rash. *Rickettsia* have been demonstrated and the vector in some places is undoubtedly a dog tick.

Jewell and Kauntze give a good illustration of the inflamed primary lesion in their *Handbook of Tropical Fevers* (Fig 72). The leg or arm is the common site

"Scrub typhus" caused by *R tsutsugamushi* was a serious menace in the areas of hostilities against Japan. The vector is one of probably *several trombiculide mites*. They attack sites bathed in perspiration, especially in subjects at rest. Rats and mice are probable reservoirs. The rash is commoner in whites. It comes out from the 4th to the th day and consists of discrete macules on the trunk. They later become papular and spread on to the limbs. The hands and face are rarely involved. The eruption often escapes notice in black subjects (p. 849).

Trypanosomiasis. It is generally said that the incubation period of sleeping sickness is from two to three weeks, *but two carefully observed cases* in Europeans in Kenya showed symptoms not more than seven days after the bite of the tsetse fly The wound produced becomes inflamed and indurated and trypanosomes have been demonstrated in the initial lesions. The organism may be found in the blood as early as the 21st day

The rash is of dusky red macules mainly on the anterior surface of the body In some cases there is a *circinate erythema* resembling a secondary syphilide This occurs most often on the trunk. Raised solid patches of pink colour which may reach 1½ inches in diameter *may replace the circinate erythema*. Some writers stress the fact that they rarely see these early eruptions.

In the late stages when there is grave asthenia bedsores and septic conditions are common in neglected natives.

Tularaemia. An erythematous, macular papular or nodular eruption may appear *from* the third to the seventh day The rash may be transient or last for a couple of months (p 470).

Undulant fever A fleeting erythema, and, rarely purpura may occur

Yellow fever The intense jaundice may be accompanied by petechiae

CHAPTER V

CIRCULATORY DISORDERS—VASCULAR AND LYMPHATIC

Varicose Veins—Cutaneous Gangrene—Raynaud's Phenomena—Elephantiasis

In this chapter we propose to review the affections contingent upon chronic obstruction of the blood and lymphatic vessels. Some of these have been dealt with elsewhere and will be merely referred to in passing, but the affections dependent upon varicose veins and the forms of gangrene met with in dermatology and the varieties of elephantiasis demand special notice.

Affections due to Varicose Veins

Varicose veins tend to produce a number of cutaneous affections, particularly if the subject is obliged to stand for long hours at work. There is an undoubted inherited tendency to their development, but general debility, ill health, pregnancy and illness are also determining factors. The valves of the veins become incompetent and as a result the flow of



Fig. 59. Varicose dermatitis.

blood in them is entirely determined by gravity, *i.e.* in the horizontal position it is negligible but in the erect position it is in the wrong direction unless modified by muscular action. Primarily varices cause a chronic congestion of the integument of the lower extremities and consequent impairment of its nutrition. The lowered resisting power of the tissues

renders them prone to bacterial invasion, particularly by the streptococci. Varicose veins may be the direct or indirect cause of (1) oedema (2) pigmentation, (3) dermatitis and eczema, (4) ulcer (5) thrombo-phlebitis, (6) lymphangitis, (7) elephantiasis, (8) sclerosis.

The pigmentation is caused by the chronic congestion and the escape of red corpuscles into the tissues. The local predisposition to eczema will be considered later (p 148). Phlebitis and lymphangitis are due to streptococcal infection and if repeated tend to elephantiasis (p 137). The sclerosis is the result of repeated attacks of inflammation of the dermis and hypoderm.

Varicose ulcer The so-called varicose ulcer may follow a bruise or



Fig. 40. Varicose ulcers.

slight traumatism. It may also be caused by (1) the rupture of a vein (2) phlebitis, (3) eczema (4), impetigo. In all these conditions a normal skin would be affected temporarily and ulceration is uncommon, but where there are varicose veins the resisting power of the tissues is lowered and chronic microbic inflammations are often set up. One of the commonest is caused by streptococci, possibly of low grade pathogenicity but active in a partially devitalised area. An inflammatory lesion is the usual precursor of the varicose ulcer. Fractures and severe injuries damaging the vessels and deep thrombo-phlebitis may produce a similar effect to varicose veins.

Clinical features. The ulcer is commonly situated in the lower half of the leg and most frequently on the inner surface. The skin over the malleoli being exposed to trauma is often affected. The lesion is ovoid or

round but by the fusion of neighbouring ulcers areas with a polycyclic out line may be involved The varicose ulcer may be of large size sometimes encircling the leg *The edge is sometimes steep and sometimes* undermined and it may be indurated and adherent to the subjacent tissues The base of granulation tissue is red or purplish, and blood may ooze from it In neglected cases the floor of the ulcer is often covered with greyish sloughs and foetid sanious pus If the sores are kept clean the exudation may be mainly serous The ulcer is remarkably insensitive and callous and particularly intractable if the base is adherent to the bone

The lymphatic *glands in the groins are enlarged*

The **diagnosis** of varicose ulcer may be attended with great difficulty In practice it will be found that the ulcerating syphilides and gummatous ulcers give the most difficulty but some of the chronic tuberculides and ecthyma may also require careful discrimination The ulcerating tertiary syphilides are commonly multiple and affect the extensor and often the upper aspect of one limb They are grouped in circles or parts of circles The syphilitic *gumma begins with a node-like swelling which softens in the* centre to form a punched-out ulcer with a wash leather like slough on the floor In doubtful cases the Wassermann or Kahn test should be applied or the effects of mercury and iodide of potassium should be tried The tuberculous ulcers usually occur in younger subjects In Bazin s disease *they are bilaterally symmetrical and affect the calf more than the inner* side of the leg In ecthyma the lesions are small and multiple and the ulcer under the scab is comparatively superficial and has shelving margins The concomitant symptoms—varicose veins oedema pigmentation and sclerosis—will be useful points in favour of varicose ulcer

Prognosis. With rest in the horizontal position varicose ulcers tend to heal rapidly but a return to the vertical position often leads to relapse In *patients of the labouring classes the limbs may be affected for years*

Treatment Treatment should be directed—

(1) To improve the local circulation to the limb and to overcome mechanical disadvantages which result from incompetent valves in the varicose veins

(2) To the removal of chronic oedema

(3) To the treatment of the skin lesion—dermatitis eczema or ulcer

In the first place rest in bed with the limb elevated is the most satis factory procedure for severe cases of ulceration Here gravity assists the circulation and the return of lymph from the oedematous limb In less severe cases firmly applied adhesive bandages of the Elastoplast type have been found to be very effective in removing chronic oedema and the ambu latory patient *thus treated provides automatic massage of the limb by his* muscular action and the response of the elastic bandage It is an advan tage to apply the bandage after the patient has had the leg elevated for some time and in most cases the bandage should commence behind the toe clefts and extend to the knee Some authorities advise applying the adhesive bandage directly over ulcers *and areas of dermatitis* with a slight preliminary cleansing and drying of the skin Very infected ulcers may have to be covered with several layers of gauze soaked in 2 per cent aqueous gentian violet before the bandage is applied If the patient com plains of much irritation it is wise to remove the bandage to see if an

eczematous process is developing because some patients are intolerant of adhesive plasters but may react to one make of bandage and not to another. Bandages are available with half or one-third of their surface covered with adhesive, so it is possible to apply the bandage technique without the adhesive plaster touching the skin.

Large varicose ulcers are best treated with an open technique in bed. Penicillin cream or the various aniline dyes may be used, and if the granulations are sluggish, a useful preparation is equal parts of scarlet-red ointment and yellow oxide of mercury paste to which 10 per cent. of cod liver oil may be added. When granulations are excessive, astringent lotions of zinc or copper sulphate or silver nitrate may be applied. A cradle is useful to keep the clothing from touching the skin. Various forms of phyciotherapy may also be employed with advantage.

Keratinisation of the granulating surface is often retarded by heat and moisture and it is advantageous to expose these lesions to the air. In many cases the skin need not be covered if a bed cradle is used.

In large indolent ulcers skin grafting may be required and, indeed amputation may have to be considered, but with patience and intelligent use of the methods outlined this ought to be a very rare procedure.

Varicose eczema and dermatitis should be treated on the usual lines. If intolerance to certain plasters has been discovered these irritants should, of course, be avoided and this applies to the sulphonamides which are very apt to cause trouble. In order to prevent relapses the dilated veins should be controlled by pressure with an elastic bandage or an elastic stocking. Permanent relief may often be secured by injecting diseased veins with a thrombosing substance. Solutions of quinine and urethane and 5 or 10 per cent. sodium morrhuate have stood the test of time, and more recently ethanolamine oleate or similar organic salts of the fatty acids have been valuable additions to this method of treatment. The object is to damage the intima of the veins by chemical action or by osmotic effect as when using very hypertonic solutions such as salt or glucose. A firm, sterile clot is then built up on the damaged surface until the vein has clotted.

In very large veins canalisation is not uncommon, either through imperfect occlusion or as a secondary process occurring later. It is advantageous, therefore, to combine high ligature with distal injection, and in cases requiring this more radical treatment, the assistance of a surgeon is desirable.

Compressive bandage technique. In using elastoplast bandages we would urge that the leg should be rested to *reduce swelling* and that the whole leg should be painted with a watery solution of an aniline dye before the application of the bandage, which should be from toes to knee. Strips of elastoplast along the outer and inner sides of the leg prevent the bandage cutting into the fragile skin, and this whole procedure reduces the risk of irritation from the bandage or from follicular or other infection.

Ulcer or eczema can receive *suitable* treatment—as by Lassar's or tar pastes, cod-liver oil or X-rays—*before* the application of a bandage. Useful pressure can be brought to bear upon the base of a deep ulcer by covering the ulcerated area widely with a sheet of sorbo rubber pared down towards the margins to prevent its cutting into the skin.

— Viscopaste or Unna's bandage may be used if Elastoplast is not tolerated. This is a cotton bandage impregnated with a paste of zinc oxide, glycerin, gelatin and water, which is liquid when heated but sets hard on cooling. It is not, of course, elastic.

It is applied, like the elastoplast bandage, from the toes to the knee *after the swelling of the leg has been reduced by rest*. It is replaced every three or four weeks and affords an excellent non-irritating support. It is quite effective and sometimes an advantage to apply a thin layer of viscopaste bandage over a leg prior to the application of an elastoplast when the skin is sensitive.

Good quality crepe bandages accurately applied are a valuable support but these bandages soon lose their elasticity and need to be frequently renewed.

The necessity for continued support after treatment and apparent cure cannot be too strongly stressed.

Schamberg's disease is mentioned here because similar changes are seen as sequelæ of varicose veins. Described by Schamberg in 1901 as a peculiar progressive pigmentary disease of the skin, this somewhat rare and probably often overlooked affection is characterised by groups of minute reddish brown puncta which coalesce to form brown patches. All the recorded cases have been in males. The lesions occur on the usual *sites of varicose lesions*. *The colour does not disappear on pressure* and there is some atrophy in the older lesions.

The eruption persists for many years and slowly extends and is apparently unaffected by treatment (see p. 271).

Histologically, the lesions consist of dilatation by blood vessels with localised cell exudation or proliferation. The pigment is hæmosiderin and melanin.

Cutaneous Gangrene

Local necrosis of the skin may be due to—

(1) *Severe traumatism*.

(2) Physical causes.—Intense heat and cold (p. 301), prolonged exposure to the X rays and radium (p. 814), powerful electric currents, high frequency electricity.

(3) Chemicals.—Strong acids and alkalies, chloride of zinc, arsenic, carbolic acid, chromium.

(4) In rare cases carbon monoxide poisoning, chloral hydrate, iodides and arsenic may cause gangrenous eruptions.

(5) Virulent bacterial infection.—Dermatitis gangrenosa pyogenica or infantum (p. 451), ulcus molle (p. 588), lymphogranuloma (p. 638), noma (p. 452), gas gangrene.

(6) Diabetes (p. 130).

(7) Nervous diseases.—Syringomyelia (p. 112), nerve leprosy (p. 507) and, *in association with pressure, the bed sore of myelitis*, compression paraplegia, etc.

(8) Interference with or suppression of the blood supply.—

(*a*) Pressure on the vessels by *neoplasms or exudations*.

(b) Contraction of the muscular coat, in ergotism and Raynaud's disease.
(c) Diseases of the intima or vessel walls:—endarteritis obliterans syphilitic endarteritis, atheroma periarteritis nodosa (p 126).
(d) Obstruction of the lumen by thrombus or embolus

Some of these conditions are considered in other parts of this work, and others are more fittingly dealt with in the text-books on surgery and medicine (see Plate 8)

Ergotism. The prolonged use of ergot, or more commonly the use of rye infected with the *claviceps purpurea* causes a local gangrene probably due to spasm of the arterioles.

The gangrenous process affects the toes and fingers, and occasionally the ears. It is usually preceded by loss of sensation, or by tingling and pain. There may also be spasms of the muscles. The necrosis is the result of stasis in the small vessels. The treatment of the local condition is on the same lines as that of peripheral gangrene

Bed-sore

The bed-sore is a form of gangrene of the skin and subcutaneous tissue caused by intermittent or continuous pressure in a patient suffering from acute or chronic disease It is particularly liable to occur in certain nervous affections myelitis, compression paraplegia, hemiplegia, etc.

The areas commonly affected are the sacral and lower vertebral regions the trochanters and malleoli, and the heels. The parts first become congested and oedematous and necrosis follows A greyish-brown slough forms, and thus covers an ulcer The ulcer may extend down to and expose or even involve the bone In some cases from secondary infection the gangrenous process is not limited to the parts exposed to pressure but spreads widely beyond them.

Bed-sores are uncommon in patients who are carefully nursed. They can usually be prevented by frequently changing the position of the patient in bed, by the distribution of the pressure by the sorbo rubber or water-bed and pillows and by keeping the parts clean and dry The greatest difficulty occurs in nervous cases in which the excreta are passed into the bed. In these, only the unremitting care of the nurse can prevent bed-sores. Spirit lotion is used to harden the skin, and the parts are frequently dusted with powders of zinc oxide and starch or siliceous earth with boric acid. If the surface is broken, the bed sore may be dressed with Tr Benzoin Co or with boric acid ointment. The ulcer itself should be surrounded with a circular water-pillow or a ring of thick plaster to prevent pressure If there be septic infection penicillin cream, tulle gras, cod-liver oil, and the aniline dyes may be used with advantage

Raynaud's Syndrome

According to Hunt 1936, Raynaud's syndrome may be defined as "Intermittent pallor or cyanosis of the extremities, precipitated by exposure to cold without clinical evidence of blockage of the large peri

pheral vessels and with nutritional lesions if present at all *limited to the* skin In other words Attacks of dead fingers or toes, brought on by cold, without obliteration of the pulse or massive gangrene Lewis and Pickering have given us a physiological definition. They say Raynaud s syndrome may be defined as the active and intermittent *closure of small arteries of the order of digital arteries supplying the extremities* it shows itself clinically by discoloration of the parts affected they become fully cyanotic or waxy white in colour often numb and their temperature falls to that of the surrounding air

The phenomenon occurs in *ten or more conditions, details of which will* be found later They may be divided clinically into *three main groups*

(1) When Raynaud s phenomenon occurs alone

1 *In normal persons exposed to cold long enough to lower the blood temperature*
2 Hereditary cold fingers
3 Raynaud s disease
4 *After local injury* to the hands and feet and in workers with vibrating tools

(2) When Raynaud s phenomenon precedes perhaps for several years, a condition of permanent coldness and cyanosis of the extremities

5 Sclerodactyly (acrosclerosis)

(3) When Raynaud s phenomenon is a temporary often insignificant phase in the development of gross vascular disease of the extremities

6 Thrombo-angeitis obliterans
7 Arteriosclerosis
8 Syphilitic arteritis
9 " Rheumatic (streptococcal) arteritis
10 Cervical rib (a very few cases)
11 In advanced pulmonary tuberculosis leukæmia and polycythæmia vera lupus erythematosus malaria chronic arsenical poisoning etc An ill-defined group needing further subdivision

Raynaud's Disease

A vascular syndrome characterised by (1) local syncope (2) local asphyxia and (3) local gangrene The extremities are usually affected and the phenomena are bilaterally symmetrical

Etiology Raynaud s disease occurs most frequently in adolescence and early adult life Exposure to cold may determine an attack but in some cases emotional disturbance and gastric disorder appear to be determining factors The actual cause is unknown but in some cases there is a syphilitic basis and in others lead, tobacco and malarial infection have been associated factors

Pathology The local syncope is believed to be caused by spasm of the peripheral arterioles The asphyxial condition is due to stasis and dilatation upon the venous side The capillary circulation is thus impaired and as a result the reaction of the skin to histamine is delayed and diminished The gangrene is caused by complete or partial suppression of the blood supply

Clinical features. (1) *Local syncope* The condition is commonly known as "dead fingers" One or more fingers or the distal part of the hand becomes white and cold, and anæsthetic The pallor may last for an hour or more and then there is a gradual reaction, the parts become red and hot and the patient experiences a sensation of burning In many cases there is a slight degree of asphyxia also and different fingers may be affected with syncope or with asphyxia.

(2) *Local asphyxia.* In its mildest form this is seen in the chilblain circulation, when it occurs intermittently with acrocyanosis. This relatively common pernicious condition should not be confused with the rarer and more serious affection described by Raynaud. The acro-asphyxia may follow the local syncope, or it may be independent of it The fingers and toes and the ears and occasionally the nose are affected. In rare cases other parts of the limbs may be involved

The fingers swell and become intensely congested; they assume a livid colour with perhaps bright patches of erythema upon the livid area. The swelling of the digits impairs their mobility and there are sensations of tension and actual pain. In some cases the affected parts are anæsthetic. The attacks of asphyxia return again and again over many years and the recurrences are determined by exposure to cold or by emotional disturbance, and are sometimes associated with gastric disorder

The general health is usually unaffected.

(3) *Local or symmetrical gangrene* The recurrent asphyxial attacks may leave small necrotic areas on the tips of the fingers or toes, or on the edges of the auricles In some cases there is considerable thickening of the distal parts of the digits. In the more severe cases the terminal phalanges become insensitive, black, and cold, and the skin necroses forming blebs. There is the usual line of demarcation of the gangrenous area, and a portion of the extremity sloughs. The actual destruction is generally less than the severity of the phenomena would suggest, but parts of the fingers or of the nose or ears separate. In some cases only one digit is affected In very rare instances the gangrenous process involves the limbs more extensively and patches may occur on the trunk. Some cases of multiple gangrene in children appear to be of the same nature Spontaneous amputation of parts of the limbs has been observed.

It is interesting to note that some patients suffering from Raynaud's disease present symptoms showing that the affection is not purely local. The most important of these is paroxysmal hæmoglobinuria occurring on exposure to cold. Occasionally there are temporary loss of consciousness, giddiness lethargy headaches, transitory hemiplegia and peripheral neuritis Epistaxis may occur

It is important to remember that the Raynaud syndrome may be caused by congenital or acquired syphilitic disease of the vessels, and in all cases the Wassermann reaction should be examined.

Treatment. In the slighter cases no special treatment is necessary In the more severe ones the patient should be kept in bed and all exposure to cold must be avoided The affected parts should be wrapped in cotton wool. Massage may be found of value Resection of the sympathetic perivascular trunks or the extirpation of the ganglionic centre is the most effective therapeutic measure. Galvanism, pyretotherapy with T.A.B.

vaccine and injections of acetylcholine have been recommended Small doses of thyroid with phenobarbitone may relieve arterial spasm Nitroglycerine and the nitrites have been found to be of temporary service *Should there be evidence of syphilis* as shown by the history or positive Wassermann reaction antisyphilitic treatment is of course indicated The *gangrenous conditions require the application of dry antiseptic dressings* The general health demands attention and the diet should contain plenty of fat

Other varieties of Gangrene

Diabetic gangrene usually affects all the tissues of part or of the whole of an extremity or of the genitalia but *most commonly affects the toes* It may follow a slight injury or infection but often there is no history of traumatism In some cases the gangrene is in the form of disseminated patches This form originates as a spreading bullous eruption The central lesions heal up while fresh blebs form at the margins of the affected area In all probability this eruption is caused by streptococcal infection The prognosis is not necessarily grave In other cases the gangrenous process develops upon a pre-existing eczema or impetigo

The essential pathological basis for diabetic gangrene is the ischæmia resulting from arterio sclerosis affecting the smaller vessels which by radiography may be seen to be calcified No doubt the disturbance of tissue metabolism also predisposes to necrosis

In severe diabetes especial care should be given to the hygiene of the feet and the absence of pulsation in the dorsalis pedis artery should be regarded as a danger signal Examination should be made for ingrowing nails septic corns and fissures and scrupulous surgical cleanliness is called for in the treatment of these lesions

The treatment must be directed to the general condition The parts must be protected by wrapping in cotton wool and strong antiseptic *applications should be avoided Surgical measures may be necessary*

Gangrene due to obstruction of the lumen of the vessels This occurs in *the aged (senile gangrene), from arterio-sclerosis,* arteritis obliterans or syphilitic endarteritis and gives rise to lesions exactly similar to those described above (Plate 8)

Periarteritis nodosa is a disease probably of infective or allergic origin in which eosinophilic infiltration of the walls of smaller vessels may give rise to nodose thickening aneurysmal swellings hæmorrhages thromboses gangrene etc This may occur in any part of the body and in any organ and is associated with pyrexia grave ill health and a great variety of obscure and puzzling symptoms

In the skin it may be responsible for a nodose erythematous rash, more or less profuse the individual lesions somewhat resembling erythema nodosum It may also give rise to necrotic ulcers *gangrene of extremities* as well as purpura and hæmorrhages of varying degree

The true diagnosis is rarely made *before death in this disease* but it should be considered in cases of pyrexia of unknown origin with superficial or deep *lesions or visceral symptoms* which might be explained by vascular damage Excision of a skin lesion for histological examination of the vessels may enable a diagnosis to be made

PLATE 8



DRY GANGRENE

I[illegible] an [illegible]lderly woman.



Elephantiasis Nostras

(Pachydermia and papillomatous excrescences.)

Gas-gangrene This condition is essentially of surgical interest. It is not seen by the dermatologist.

General symptoms and treatment of gangrene. In *dry gangrene* there is interference with the arterial supply but the return of blood and lymph is unchecked The tissues become mummified, but there may be no septic infection. The areas are of a brown, purplish or yellow tint, slightly depressed below the surrounding skin. They are cold and hard to the touch and anæsthetic. The patient may complain of irritation, burning tingling or of acute pain. In course of time a line of demarcation forms between the living and the necrosed tissue The slough contracts and is eventually thrown off Amputation is usually necessary but where there is advanced disease of the vessels or some grave constitutional cause it is often better to avoid operation and allow the natural process of removal of the dead tissue to take place with as little interference as possible. The parts must be kept scrupulously clean and dry and dressed with antiseptics and wrapped in cotton wool. The process of separation may take a long time and is often painful.

In *moist gangrene* the tissues generally are sodden because there is obstruction to the return of blood and lymph. Blebs form upon the dark purplish or greyish soft skin and these blebs often contain blood. Such a condition is highly favourable to bacterial invasion, and upon this depends the rapidity and extent of the destruction It may be necessary to amputate before there is a definite line of demarcation

OBSTRUCTION OF LYMPHATICS

Elephantiasis and Pachydermia

(Gk. *pakhus*, thick)

Any condition which causes the blocking of main lymphatic trunks and especially the obliteration of the finer lymph channels may cause the remarkable hypertrophy of the skin and subcutaneous tissue to which the name " pachydermia " has been applied. The surface of the thickened integument often becomes verrucose. " Elephantiasis " is the term applied to a grossly enlarged limb or part.

The nomenclature is somewhat confusing but we find it convenient to retain the name " Filarial elephantiasis " for the original disease to which the name was given. *E nostras* is useful to designate other varieties We propose to drop the term " pseudo-elephantiasis " and speak of tuberculous or syphilitic forms of elephantiasis, etc. where the cause is apparent. It will therefore be useful at the outset to enumerate the conditions which may cause elephantiasis and pachydermia These are :—

(1) A congenital often hereditary and familial, obstruction of lymphatic trunks known as trophœdema (Milroy's or Meige's disease).

(2) Blocking of lymphatics by *Filaria* (*Wuchereria*) *bancrofti* and *Onchocerca volvulus* This is the usual cause in the tropics but even in these cases recurrent streptococcal erysipelatoid attacks appear to be an important feature of the elephantiasis.

(3) Streptococcal and possibly other microbic infection (Phlegmasia alba dolens should be included here).

(4) The pressure of cancerous tumours

(5) The extensive removal of lymphatic glands

(6) Tuberculous lymphangitis (p 487) leprosy (p 503) tertiary syphilis (p 544) yaws (p 593) lymphopathia venerea (p 638)

(7) Venous obstruction e g varicose veins

(8) Fractures and operations (e g on breast) interfering with the lymphatic flow

It must be noted that in the majority of the conditions enumerated recurrent erysipelatous attacks i e streptococcal infection are an important feature and even in filarial elephantiasis must be deemed an *essential factor* in causing elephantiasis

Pathology The characteristic features are firstly an acute inflammation of the lymphatics and secondarily of the associated glands The next stage is œdema due to changes in the lymphatic vessels A solid œdema follows This leads to hyperplasia of the skin and subcutaneous tissues The macroscopical anatomy studied in amputated parts shows that the tissue is hard and tough and gelatinous on section Plasma exudes from the cut surface The dermis may be from ½ to 1 inch in thickness and the subcutaneous tissue is often two or three times its natural volume and intimately adherent to the subjacent tissues The lymphatic channels and the veins stand widely open on the cut surface Histologically the tissue is found to consist of round or spindle cells with masses of leucocytes and plasma cells in the meshes of the connective tissue The walls of the vessels are thickened the glands of the skin atrophic The fat of the hypoderm is often increased In the pachydermatous skin the papillæ are elongated and there is hyperkeratosis

The microscopic appearances indicate that the process is inflammatory and not a simple œdema

Elephantiasis nostras

(1) *From recurrent erysipelatous inflammation etc* In a considerable number of cases there is some evident breach of the surface which allows the entrance of the infecting organism, usually the streptococcus There may be obvious lymphangitis with swelling redness pain tenderness and pyrexia and enlargement of the lymphatic glands In other cases there is erysipelas or cellulitis

The inflammation passes off in a few days but it is noticed that the parts are slightly swollen. From time to time often at short intervals, fresh attacks of lymphangitis or of erysipelatous inflammation occur and after each there is a further increase in the size of the part, ultimately resulting in chronic hypertrophy

When the lower limb is affected the member may be nearly *half as large again* as the corresponding leg The surface may be quite smooth and shining or pigmented or purplish in colour In other cases the surface is scaly or verrucose with papillomatous excrescences (Plate 9) In many instances there are soft compressible swellings which on puncture exude clear lymph or a milky fluid Such swellings are lymph varices (lymphangiectases). Similar conditions follow ulcers of the legs,

chronic eczema, etc. In some cases there are no inflammatory symptoms and no pyrexia, but a similar change is found in the tissue affected. There appears to be some general or local predisposition for the erysipelatous attacks may have no obvious cause.

In adults the lower extremities are the common site. In young subjects the lips may be involved and the swelling causes great disfigurement (Fig 62). Recurrent attacks of erysipelas may lead to extensive swelling



Fig. 61 Elephantiasis nostras.

of the eyelids, the nose, the auricles and other parts of the face.

(2) *From disease or removal of the lymphatic glands.* Elephantiasis may follow extensive removal of the lymphatic glands and also tuberculous disease, sclerosing syphilitic adenitis and cancerous metastases. It is an important feature in lymphopathia venerea (p 636) where it affects the female external genitals (esthiomène) and may be extensive in the lower limbs if there be surgical interference in the disease.

The lower limbs and the external genitals are usually involved in the syphilitic forms (Fig 291). Both the upper and lower limbs may be affected in tuberculous lymphangitis (Fig 253). The upper limbs are involved in cancer of the breast. The affected parts become enormously swollen and painful. At first they pit on pressure, but ultimately they

become indurated In cancer *en cuirasse* the diffuse infiltration is often mainly due to lymphatic obstruction

(8) *Congenital elephantiasis* In rare cases an elephantiasic condition is congenital There appear to be two types (*a*) one due to an anatomical anomaly and (*b*) trophœdema (p 58) which may not appear till early adult life and possibly due to vaso motor neuroses In the case figured here (Fig 63) the patient a girl of sixteen had suffered from swelling of



Fig 62 Elephantiasis of lip from recurrent streptococcal inflammation Girl æt 15.

he leg and thigh from birth The limb was much enlarged the surface white and glistening and upon it there were numerous small translucent vesicles Some of these ruptured spontaneously from time to time giving exit to a milky fluid The quantity lost was very large and the girl was emaciated On two occasions operations had been performed with the object of removing a tumour in the upper part of the thigh. One operator found that the growth which was evidently lymphangiomatous extended into the abdominal cavity and could not be removed By removing fatty foods from the dietary the fluid became clear and translucent but the

chylous character returned a few hours after the patient had taken a meal containing butter and milk.

Diagnosis. Where the elephantiasic condition follows disease or removal of the lymphatic glands there is no difficulty. In the inflammatory type the history of repeated attacks of erysipelatous inflammation or



Fig. 63. Congenital elephantiasis. Numerous nodular lymph varices.

lymphangitis with the progressive enlargement of the affected areas are sufficiently characteristic.

Prognosis. If of long duration, and if the cause cannot be removed, there is no prospect of improvement.

Treatment. The acute attacks of inflammation are treated on general lines, the parts being kept at rest and the inflammation soothed by the application of lead lotions, ichthyol (10 per cent. in vaselin), or by fomentations. Penicillin and the sulphonamides are of great value in these outbreaks. The general hygiene requires attention, and good food is essential. Compression of the swollen limb by properly fitting bandages may be used with advantage where an extremity is affected. Lymphangioplasty has been performed, but without obvious benefit in our experience.

extreme elephantiasis. Whether the parasite causes obstruction of the lymphatics or predisposes to lymphatic inflammations of bacterial origin is uncertain. The phenomena of filarial fever point to the latter. In extreme cases ligature of the femoral artery has been practised in elephantiasis of the leg. Amputation of the enlarged scrotum or limb may be necessary. In early cases removal of the patient to a temperate climate has proved beneficial. Antimony given intravenously or intramuscularly appears to diminish the number of filariæ in the circulation, but the effect is not permanent. Intramuscular injections of "Oscol stibium," a colloidal preparation of antimony, in doses of 0.5 to 1 c.c. every second day are recommended by Anderson. Filarial fever, when due to streptococcal infections which are an important factor in elephantiasis, requires early treatment with penicillin or a sulphonamide, but these remedies have no lethal effect on the filariæ.

REFERENCES.—C. DANIELS. *Trans. Roy. Soc. Med.* (Tropical Section), 1933, XXVII, p. 23 (Discussion). GILLIES and FRASER. *Brit. Med. Jour.* 1935, I, p. 90.

CHAPTER VI

RETICULO-ENDOTHELIOSES OF THE SKIN

Mycosis Fungoides—Hodgkin's Disease—Leukæmia Cutis—
Kaposi's Sarcoma

The diseases which are grouped under the heading of reticulo-endothelioses and which arise from the reticulo-endothelial tissues scattered throughout the body show some features which are suggestive of the chronic infective granulomata and others which resemble the malignant neoplastic diseases. This applies to the histo-pathological as well as the clinical features.

The group includes the leukæmias of all types acute and chronic, lymphatic and myeloid with their characteristic blood changes. It includes leukæmia cutis (where changes in the blood may be absent), Hodgkin's disease and mycosis fungoides. By some authorities sarcoidosis and the sarcomata are included under this heading but we have dealt with them elsewhere, excepting the multiple idiopathic pigment (so-called) sarcoma of Kaposi.

The commonest and earliest symptom is intense itching, which may be followed by an eruption indistinguishable from urticaria or eczema, seborrhoeic dermatitis, psoriasis, exfoliative dermatitis or other non specific reactions.

Cellular infiltration follows in a diffuse or focal fashion (papular nodular lichenoid or plaque) and can be distinguished clinically and histologically. The pathology may not be distinctive of any particular disease, but may merely indicate that it is of the group of reticulo-endothelioses.

Sometimes the infiltrated tumours may later involve the skin, mucous membranes and viscera and may ulcerate or fungate.

For a period the response to X-ray therapy is dramatic but the ultimate prognosis is fatal.

Mycosis Fungoides. Granuloma Fungoides

(Gk. *mukes*, mushroom)

It is difficult to place this remarkable disease By some it is looked upon as allied to the sarcomata and by others as connected with cutaneous leukæmia. The histology presents difficulties In part the appearances simulate a granuloma and again a neoplasm. The clinical course suggests a similar view but the later stages are more like those of a new growth.

Etiology The cause of mycosis fungoides is unknown. It is not hereditary and not contagious. Of 74 cases collected by Sequeira 46 were males and 28 females. Most of the patients were between thirty and fifty years of age the extremes being fifteen and seventy-four Rarely injury appears to be a cause but no organism has been isolated.

Pathology By the kindness of Professor H. M Turnbull we are able to include here a valuable description of the histology of mycosis fungoides based upon his observations on autopsies at the London Hospital.

The histological changes in mycosis fungoides are those of a chronic granulomatous inflammation. They are characterised by an infiltration

extreme elephantiasis Whether the parasite causes obstruction of the lymphatics or predisposes to lymphatic inflammations of bacterial origin is uncertain The phenomena of filarial fever point to the latter In extreme cases ligature of the femoral artery has been practised in elephantiasis of the leg Amputation of the enlarged scrotum or limb may be necessary In early cases removal of the patient to a temperate climate has proved beneficial Antimony given intravenously or intramuscularly appears to diminish the number of filariæ in the circulation but the effect is not permanent Intramuscular injections of Oscol stibium a colloidal preparation of antimony in doses of 0 5 to 1 c c every second day are recommended by Anderson Filarial fever when due to streptococcal infections which are an important factor in elephantiasis requires early treatment with penicillin or a sulphonamide but these remedies have no lethal effect on the filaria

REFERENCES—C DANIELS, *Trans. Roy Soc Med.* (Tropical Section) 1935, XXVIII p 23 (Discussion). GILLIES and FRASER, *Brit Med Jour.*, 1935 L, p. 96

process in the internal organs is essentially similar in the liver the infiltration commences in the portal spaces, but by extension and confluence may involve large areas.

Clinical features. The disease develops insidiously In the majority of cases there is a *premycosic* stage characterised by—(1) An intense pruritus; (2) a polymorphic eruption or (3) erythrodermia. In rare cases the tumour formation is the first manifestation.

(1) *Onset with pruritus* The itching is general and of very long dura

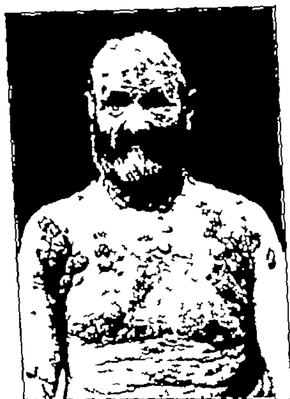


FIG. 87 Mycosis fungoides.

tion, and unaccompanied by any obvious change in the skin. This condition may last for several months to several years.

(2) The *polymorphic eruption* may be transitory or persistent. There may be a primary patch, which precedes the generalised eruption Various types of lesion occur Sometimes they are macular or in the form of plaques of a red or purplish colour and occasionally blebs appear on them. They are of varying extent and their margins are ill-defined. In other cases the areas are like patches of dry eczema or psoriasis slightly raised above the surface ill-defined and of purplish or yellowish tinge The surface may be scaly occasionally oozing or covered with dry crusts Infiltration may be present In other cases again, the lesions resemble a

with large and small lymphocytes, large mononuclear leucocytes, plasma cells and eosinophil and neutrophil leucocytes associated with a proliferation of fibroblasts or reticulum cells, these processes leading to the formation at first of massive cellular nodules and later of scars. The basophil mononuclear cells preponderate greatly in the infiltration, but eosinophil leucocytes are usually abundant and conspicuous; mast cells are only slightly, if at all, increased in number; the fibroblasts in the early stages are spheroidal, but later become spindle shaped; there are occasionally large giant cells with numerous small oval nuclei that are usually disposed peripherally. The granulomatous nodules occur for the most part in the skin, but similar nodules may be found within the body, for instance in the mucosa of the tongue, in the myocardium and in the liver, whilst in the

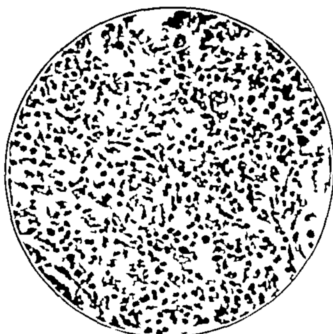


Fig. 60. Mycosis fungoides. Microphotograph of section. ⅙ obj.

lymphatic glands and spleen there is a general inflammatory infiltration of similar cytology with or without focal areas of sclerosis.

In the skin the infiltration is perivascular and at first appears in the outer part of the reticular layer of the dermis, though the papillary layer and even the epidermis may be affected early in a few places. At this stage the papillary and subpapillary vessels are dilated and engorged. The infiltration extends downwards through the dermis round vessels and therefore round sweat ducts and coils, to involve the subcutis in places. The perivascular infiltrations by enlargement become more or less confluent. Meanwhile the papillary layer is altered by œdema, fibroblastic proliferation and less massive infiltration, and the interpapillary processes of the epidermis lengthen and broaden whilst the intervening epidermis is thinned; the epidermis may necrose and be ulcerated and the granuloma fungate. The collagenous and elastic fibres rapidly disappear in the early infiltration; later the infiltrating cells decrease as fibroblastic activity increases until a dense scar tissue is formed devoid of elastic fibres. The

trated plaques of a brick red colour with the surface of the skin finely mamillated or like orange skin or there may be tumours.

(3) *Erythrodermia.* The initial lesions are red or violet tinted plaques chiefly in the flexures, but eventually the whole of the surface may be bright red. The skin is dry and there may be fine desquamation. The hair may fall out all over the affected parts but the nails are not affected The itching is intense The skin later becomes œdematous and the lymphatic glands everywhere become swollen After a variable time four to ten years small nodules with characteristic structure may appear Rarely death takes place without the development of the tumours

The *tumours* appear rarely as the first symptom. Where this occurs the condition is described as mycosis fungoides *à tumeurs d'emblée* Usually they develop as a sequel to the pruritus or to the polymorphic eruptions, or coincident with them. They may be in the form of infiltrated plaques of variable size of a brick red colour with a mamillated surface or rounded tumours The mycosic tumour varies in size from a cherry to half an orange or more It may develop on one of the primary lesions or on previously healthy skin. The tumours are soft, of a dull red colour hemispherical or perhaps nodular on the surface They have often a narrow constriction at the base and have been likened to a tomato or mushroom on the skin. There may be semicircular or crescentic lesions designated the "horseshoe tumours.

They often ulcerate destroying the epidermis, but extend peripherally Sometimes enormous tumours are seen as big as a child's head or large ulcers form, exuding a sanious discharge Gangrene is a rare sequel.

Curiously the tumours may disappear spontaneously with or without scars and pigmentation

Mycosis affects the trunk, the upper parts of the extremities and the face The glands are always enlarged early Alopecia of the affected parts is usual. There are no characteristic blood changes.

The disease may last for from two to twenty years with spontaneous remissions which simulate cure Intercurrent acute febrile illness sometimes causes disappearance of the tumours. In the late stages the patient becomes asthenic his digestive organs fail and he dies in marasmus or from complications One of our patients died from pulmonary embolism.

In the acute form described by Vidal and Brocq the tumours are localised to one region appear in healthy skin, and the glands are not involved Brocq considers this form as closely related to the sarcomata.

Diagnosis. The diagnosis in the premycosic stage is often exceedingly difficult "In all cases of ambiguous pruritic dermatoses which are prolonged and rebellious to treatment the possibility of the disease being the premycosic stage of mycosis fungoides should be borne in mind" (Besnier). The chronicity of the disease and the characters of the plaques are suggestive but the feature upon which reliance is to be placed is the persistence of a polymorphous eruption resembling eczema, lichen or psoriasis with intense itching In a large number of cases however the nature of the disease can only be suspected until the development of the tumours A biopsy may be of value When the characteristic tumours appear the diagnosis is no longer in doubt Gaucher and others have reported successful complement fixation tests in the premycosic stage

lichen They vary in number and in extent but are always attended by intense itching

Sometimes the trunk is widely involved The face may be affected,

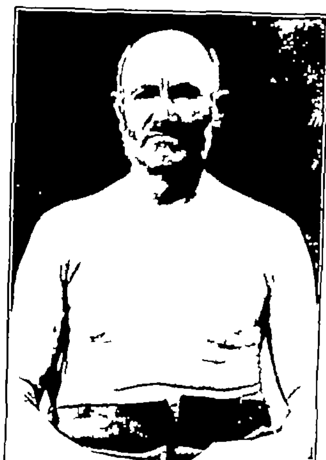


FIG 68 The same patient after treatment by X rays The tumours reappeared after several months.

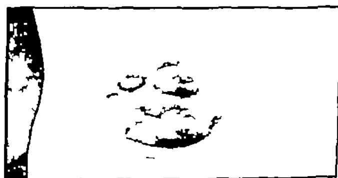


FIG 69 Mycosis fungoides. A group of tumours in the back of a man aged 50

and if there is infiltration an appearance which is leonine like nodular lepra may be produced

Following these lesions or coincident with them there may be infil

adenique" of Dubreuilh) occurs These papules consist of an inflammatory round-celled infiltration round the sweat glands. These papules are red or dusky in colour and are found on the trunk and limbs They come out in crops.

(7) Lichenification and pyogenic infection are found as the result of the scratching

(8) Rarer skin eruptions which have been recorded are bullæ, morbilliform erythema, urticaria and purpura.

(9) Lymphadenomatous nodules in the skin are uncommon Sir Humphry Rolleston was only able to collect twelve cases in the literature. The lesions may vary from pin-head sized nodules to flattened plaques. Their growth is slow and the face and scalp are more often affected than the trunk. In some cases nodular leprosy is closely simulated

Lymphadenoma is distinguished from leukæmia and allied conditions by the blood count.

Treatment by arsenic which may be given in the form of neo-salvarsan intravenously or by the mouth, should be tried Some relief may be obtained by X rays

Leukæmia Cutis

The cutaneous lesions in acute leukæmia are

(1) Cutaneous tumours formed by cells similar to those found in the blood. The lesions are slaty-blue or plum-coloured nodules or discs. They are small and may be extremely numerous but rarely become confluent There is a very high white blood cell count. In Dr Barber's case there were 400 000 white cells, 70 per cent. of primitive type small lymphocytes being only 6 per cent Green tumours occur in chloroma.

(2) Polymorphic rashes sometimes called "leucemides." Purpura is by far the commonest eruption and the extravasations may be petechial or of large size The less frequent cutaneous manifestations are an exfoliative erythrodermia and erythemata of papular vesicular and morbilliform type Herpes labialis is not uncommon Pruritus is rare

Chronic Myeloid Leukæmia. Leukæmic tumours or infiltrations of the skin are rare In Rolleston and Fox's case the lower part of the trunk was covered with nodules closely resembling in colour and size half a damson In the late stages of myeloid leukæmia hæmorrhage may occur The diagnosis is made by the blood count

Chronic Lymphoid Leukæmia is seen in two forms —

(1) *Tumours* True leukæmic tumours of the skin occur most commonly in the chronic lymphoid type The growths are most frequent on the face and but for their colour which is usually a livid red simulate closely the leonine facies of nodular leprosy The tumours may be miliary and are usually small. In rare instances they have been distributed all over the surface There is intense pruritus and secondary eruptions due to scratching are common. The patients are usually in late middle life and the disease runs a chronic course The blood shows a high leucocytosis 200 000 or more and the diagnosis is made by the differential count.

(2) Other cutaneous manifestations are—generalised erythrodermia

Prognosis Until the X-ray treatment was used for this affection the prognosis was hopeless In a number of cases the tumours and the erythroderma have been entirely removed by radiotherapy and patients have been free from recurrence for some years Our experience is however not yet sufficiently extensive to speak of cure It must be remembered that spontaneous resolution sometimes occurs

Treatment of mycosis fungoides In the early stages the irritation should be controlled by suitable sedatives as long as possible and a simple lotion such as 2 per cent of phenol in lotio plumbi may be applied to the itching and reddened areas of skin Ichthyol cream is suitable when the areas become dry or scaly When the pruritus is not controlled by this means X ray therapy is extremely valuable Doses of 50 to 100 *r* often relieve irritation but should not be given too freely because after a while they become less effective

When tumours arise doses of 200 to 400*r* through 1 mm. of aluminium may be given to the circumscribed area and repeated at intervals of a week until 1 200 *r* have been given In this way tumour formation is often greatly retarded but eventually more active growths require dosage as for malignant lesions and ultimately this is likely to be ineffective and the inevitable extension to the lymphatic glands and viscera terminates the disease

Lymphadenoma, Hodgkin's Disease, Lymphogranuloma

The skin is affected in a considerable proportion of cases of lymph adenoma Ziegler places the incidence at 25 per cent., while in Cole s series 30 3 per cent had cutaneous manifestations. The majority of the patients are young subjects and the skin lesions are usually late in the course of the disease

The skin changes met with in Hodgkin s disease vary from itching and pruritic eruptions possibly of toxic origin to actual lymphadenomatous nodules in the corium and in the summary of these affections which follows we have drawn freely upon Sir Humphry Rolleston s admirable paper on the subject

Skin affections in lymphadenoma

(1) *Pigmentation* which may be due to irritation of the sympathetic or pressure on the adrenal vessels by retro-peritoneal glands. It must however be remembered that arsenic which is commonly given in Hodgkin s disease may cause pigmentation and X ray pigmentation may also occur

(2) Jaundice may be caused by pressure of enlarged glands on the bile ducts The jaundice may be intermittent and depend on recurrent febrile attacks

(3) Loss of hair and alterations in its colour may occur

(4) Hyperidrosis may be associated with the febrile attacks.

(5) Pruritus may be the earliest symptoms but is often a late phenomenon It is usually general Pruritus may be accompanied by eosinophilia but there is no direct correspondence in their incidence There is some evidence pointing to the itching being due to a *circulating* toxin

(6) Prurigo An eruption of itching papules (prurigo lymph

adenique" of Dubreuilh) occurs. These papules consist of an inflammatory round-celled infiltration round the sweat glands. These papules are red or dusky in colour and are found on the trunk and limbs They come out in crops.

(7) Lichenification and pyogenic infection are found as the result of the scratching

(8) Rarer skin eruptions which have been recorded are bullæ morbilliform erythema, urticaria and purpura

(9) Lymphadenomatous nodules in the skin are uncommon. Sir Humphry Rolleston was only able to collect twelve cases in the literature The lesions may vary from pin head sized nodules to flattened plaques Their growth is slow and the face and scalp are more often affected than the trunk. In some cases nodular leprosy is closely simulated.

Lymphadenoma is distinguished from leukæmia and allied conditions by the blood count.

Treatment by arsenic which may be given in the form of neo-salvarsan intravenously or by the mouth, should be tried. Some relief may be obtained by X rays

Leukæmia Cutis

The cutaneous lesions in acute leukæmia are:

(1) Cutaneous tumours formed by cells similar to those found in the blood The lesions are slaty blue or plum-coloured nodules or discs They are small and may be extremely numerous, but rarely become confluent. There is a very high white blood cell count. In Dr Barber's case there were 400 000 white cells 70 per cent. of primitive type small lymphocytes being only 6 per cent Green tumours occur in chloroma.

(2) Polymorphic rashes sometimes called "leucæmides." *Purpura* is by far the commonest eruption and the extravasations may be petechial or of large size The less frequent cutaneous manifestations are an exfoliative erythroderma and erythemata of *papular* vesicular and morbilliform type *Herpes labialis* is not uncommon Pruritus is rare

Chronic Myeloid Leukæmia. Leukæmic tumours or infiltrations of the skin are rare In Rolleston and Fox's case the lower part of the trunk was covered with nodules closely resembling in colour and size half a damson In the late stages of myeloid leukæmia hæmorrhage may occur The diagnosis is made by the blood count.

Chronic Lymphoid Leukæmia is seen in two forms:—

(1) *Tumours* True leukæmic tumours of the skin occur most commonly in the chronic lymphoid type The growths are most frequent on the face and but for their colour which is usually a livid red, simulate closely the leonine facies of nodular leprosy The tumours may be miliary and are usually small. In rare instances they have been distributed all over the surface There is intense pruritus and secondary eruptions due to scratching are common. The patients are usually in late middle life and the disease runs a chronic course The blood shows a high leucocytosis, 200 000 or more and the diagnosis is made by the differential count

(2) Other cutaneous manifestations are—generalised erythrodermia

Prognosis Until the X ray treatment was used for this affection the prognosis was hopeless In a number of cases the tumours and the erythrodermia have been entirely removed by radiotherapy and patients have been free from recurrence for some years Our experience is however not yet sufficiently extensive to speak of cure It must be remembered that spontaneous resolution sometimes occurs

Treatment of mycosis fungoides In the early stages the irritation should be controlled by *suitable sedatives as long as possible and a simple* lotion such as 2 per cent of phenol in lotio plumbi may be applied to the itching and reddened areas of skin Ichthyol cream is suitable when the areas become dry or scaly When the pruritus is not controlled by this means X ray therapy is extremely valuable Doses of 50 to 100 *r* often relieve irritation but should not be given too freely because after a while they become less effective

When tumours arise doses of 200 to 400*r* through 1 mm. of aluminium may be given to the circumscribed area and repeated at intervals of a week until 1 200 *r* have been given In this way tumour formation is often greatly retarded but eventually more active growths require dosage as for malignant lesions and ultimately this is likely to be ineffective and the inevitable extension to the lymphatic glands and viscera terminates the disease

Lymphadenoma Hodgkin's Disease, Lymphogranuloma

The skin is affected in a considerable proportion of cases of lymphadenoma Ziegler places the incidence at 25 per cent., while in Cole s series 30 3 per cent had cutaneous manifestations. The majority of the patients are young subjects, and the skin lesions are usually late in the course of the disease

The skin changes met with in Hodgkin s disease vary from itching and pruritic eruptions possibly of toxic origin, to actual lymphadenomatous nodules in the corium and in the summary of these affections which follows we have drawn freely upon Sir Humphry Rolleston s admirable paper on the subject

Skin affections in lymphadenoma

(1) *Pigmentation which may be due to irritation of* the sympathetic or pressure on the adrenal vessels by retro-peritoneal glands. It must however be remembered that arsenic which is commonly given in Hodgkin s disease may *cause pigmentation and X ray pigmentation* may also occur

(2) Jaundice may be caused by pressure of enlarged glands on the bile ducts The jaundice may be intermittent and depend on recurrent febrile attacks

(3) Loss of hair and alterations in its colour may occur

(4) Hyperidrosis may be associated with the febrile attacks.

(5) Pruritus may be the earliest symptoms but *is often a late* phenomenon It is usually general Pruritus may be accompanied by eosinophilia but there is no direct correspondence in their incidence There is some evidence pointing to the itching being due to a *circulating* toxin

(6) Prurigo An eruption of itching papules (prurigo lymph

adenique of Dubreuilh) occurs. These papules consist of an inflammatory round-celled infiltration round the sweat glands. These papules are red or dusky in colour and are found on the trunk and limbs They come out in crops.

(7) Lichenification and pyogenic infection are found as the result of the scratching

(8) Rarer skin eruptions which have been recorded are bullæ, morbilliform erythema urticaria and purpura

(9) Lymphadenomatous nodules in the skin are uncommon Sir Humphry Rolleston was only able to collect twelve cases in the literature The lesions may vary from pin-head sized nodules to flattened plaques. Their growth is slow and the face and scalp are more often affected than the trunk. In some cases nodular leprosy is closely simulated.

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(2) Other cutaneous manifestations are—generalised erythrodermia

with infiltration of the true skin simulating pityriasis rubra and scaly erythematous patches

The pigmentation seen in these cases may be due to the administration of arsenic but may appear independently Urticarial lesions have also been described

Lymphoblastic erythrodermia Panton and Sequeira have described a series of cases which should be separated from the leukæmias proper under the name of Lymphoblastic Erythrodermia for the purpose of differentiating it from the previously described types and from mycosis fungoides (see p 275 and Plate 20)

"Lymphocytoma of the skin is the name applied to a rare affection in which skin coloured or reddish translucent papules and nodules arise about the face and sometimes on genitals The histological appearances are those of a lymphoid infiltration with germ centres suggesting lymph gland tissue There are no associated blood or other changes

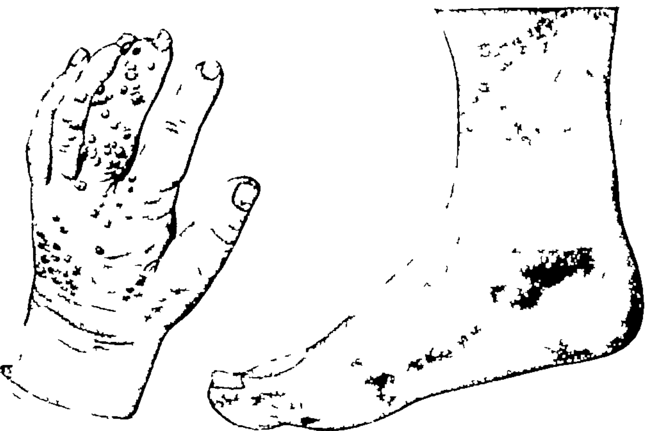
Sarcoidosis is classed by clinicians especially physicians, as a reticulo-endotheliosis Its dermatological aspect is considered on p 502

Multiple Idiopathic Pigment (so-called) Sarcoma of Kaposi

Histologically and clinically this condition should in our opinion be removed from the sarcomata It appears to be a granuloma of peculiar type The disease appears first on the hands and feet symmetrically but it may spread to adjacent parts of the limbs and become generalised In an early case recently under our observation the primary affection was a symmetrical purple congestion of the extremities on which small nodules of similar colour developed There may however be small nodules from the onset The small nodular tumours are always most numerous on the extremities There is rarely much pain and the lymphatic glands are not affected The condition may remain stationary or gradually undergo resolution More rarely the affection spreads and the lesions may ulcerate

The first case described in England was a Galician Jew who was under Dr Pringle and Sir Stephen Mackenzie and who after having a leg amputated recovered He died in the London Hospital at an advanced age from heart disease secondary to emphysema A London stonemason with severe gout was for a long time under Sequeira s observation The hands and feet were affected and the condition is shown in Plate 10 He improved gradually and has not been seen for some years. A third case shown at the Royal Society of Medicine was also in a gouty patient a German aged 80 Here the affection was also on the extremities but more on one side than the other

The histology of the second case was investigated by Dr Bulloch who concluded that the lesions were inflammatory and not neoplastic Spindle cells and fibrous tissue with many dilated vessels were found. The pigment was as Kaposi had described entirely due to hæmorrhages Our cases had all the features which Sir J Hutchinson described as symmetrical purple congestion of the skin and we have no doubt were of the same type Dr Turnbull, who has examined two cases histologically found the earliest change to be capillary hyperplasia The pigmentation was due to multiple hæmorrhages The other changes were of an inflammatory



Multiple Idiopathic Pigment Sarcoma (so-called) of Kaposi.
Showing purplish colour and nodular tumours.

[To face p. 142.



nature the infiltration consisting of fibroblasts and mononuclear cells. The patients have nearly all been middle-aged or elderly men but a very few cases have been described in women

The cause of the disease is unknown. Two of our patients had suffered from severe gout and Hutchinson gives this as the cause of his symmetrical purple congestion Some of Kaposi's patients died with diffuse dark purplish patches widely spread on the skin and on the mucous membranes, the fatal issue being attended with extreme wasting melæna and hæmoptysis. Tumours similar to those on the skin were found post mortem in the viscera, but as indicated above a prolonged course and even recovery are not uncommon That in some cases this condition may pass on to true sarcoma is exemplified by a man who had been under Sequeira's care since 1012 After twelve years in which the disease followed the common course a nodular rapidly extending soft tumour developed on one leg The new development was examined microscopically and found to be round-celled sarcoma The limb was amputated, and later a secondary nodule above the stump has been removed.

The Plate (10) illustrates the characteristic purple congestion of the extremities. The affection is always bilaterally symmetrical and the thickening of the integument impedes the free movement of the fingers.

The purplish red tumours are softer than the general eruption and are highly vascular We have only once seen a lesion on the mucous membranes, and that occurred in a man of fifty in whom a purplish congested plaque appeared on the right side of the soft palate It caused no pain and was only found on routine examination. The lesion disappeared completely as the result of X-ray treatment.

Treatment. Arsenic in large doses should be tried. Radiotherapy has proved useful in early cases.

REFERENCE.—W. N. GOLDSMITH, E. C. WARNER, A. H. T. ROBB-SMITH. *Symposium on Reticuloses* 1944, *Brit. Journ. Derm. and Syph.*, 56, 167

GROUP 3

CONSTITUTIONAL DISORDERS

CHAPTER VII

ECZEMA POMPHOLYX

Introduction

It was suggested in the opening chapter that dermatology offered the student and practitioner a natural and valuable field for the study of medicine. To utilise this field it is essential to adopt an intelligent approach to the subject and along these lines we may resolve the apparent paradox that while dermatological medicine should be most readily comprehended it too often creates a sense of confusion.

The first point to appreciate is that as no two individuals are alike the manifestations of the same disease in different individuals will necessarily differ. At the same time just as there are essential features common to all human beings so the essential features of particular diseases are always the same. The study of disease in the skin thus trains the student in the observation of essential fundamentals and in the proper assessment of individual and superficial variations.

The second essential to grasp is that for patient and doctor every disturbance in the health of the skin is associated with some subjective or objective manifestation. In the study of internal medicine we are in the habit of differentiating clearly between organic disease—the manifestation of which we have seen in the post mortem room and have related to clinical findings—and functional disorders such as headache dyspepsia which are not in our minds associated with objective changes. These disorders are of course associated with objective manifestations could we but study the organ concerned at the time the patient suffers from the symptom but the changes are of a physiological and transitory character. In *dermatology all these physiological disturbances* are manifest to the observer and are liable to be confused with the manifestations of pathological disease. An erythrodermia or eczema will pass unobserved in the *post mortem room*.

Bearing those points in mind we have endeavoured to present the subject as it illustrates the two major aspects of ill health and the following text *is arranged in two sections the first of which* deals with functional or physiological disorders—the constitutional or personal or neo Hippocratic medicine of the general text book—and the subsequent *sections deal with morbid or pathological diseases* dependent upon particular morbid processes and associated with substantial and characteristic structural changes. Some few affections are not as yet clearly *defined and overlap into both fields*.

Constitutional or endogenous medicine of the skin as in the wider field concerns itself with the peculiarities of the individual and the *relationship and adaptation* of that individual to the particular environment in which he finds himself. It is with constitutional dermatology that we shall deal in this section.

So far as the individual is concerned it is obvious that factors of inheritance and the environmental influences of early life must play a paramount part. Later in life environment must be interpreted in a very wide sense and includes climatic and physical factors clothes and toilet care diet and influences bearing upon dietetic and metabolic health; home life status and economic factors nature and conditions of employment and of leisure occupation psychological influences in domestic and private life and in relation to employment and all those ties which relate the individual to society and to the state These are the concern of what is now being termed social medicine and recognised as covering the major part of general medical practice Dermatology should be based upon general medical practice in its widest sense and we must therefore give the fullest attention to this aspect of preventive and practical medicine

The three major environmental factors are the psychological, nutritional and industrial factors and they constantly overlap and are closely interrelated. We shall give a little attention to each.

The body cannot function normally unless adequately nourished and the skin readily shows evidence of malnutrition. As elaborated in a previous chapter diet is concerned first with the provision of energy-producing foodstuffs—proteins carbohydrates and fats—and with certain essential food factors—vitamins, minerals and salts—and deficiency in respect of any of these factors is reflected in the tone and characters of the skin and its reaction to environmental influences. It must not be overlooked that though the diet provided may be adequate the foodstuffs may not be assimilated because of the manner or circumstances under which they are provided or because of disturbance in the psychological or physical health of the patient or the condition of his gastro-intestinal tract and for one or more of these reasons deficiency diseases may still be manifest

Apart from the particular manifestations of malnutrition we have constantly to bear in mind the importance of this in relation to all functional activity of the skin It is therefore a common predisposing factor in the etiology of such reactions as eczema and dermatitis, seborrhoeic and psoriatic and other disorders of a constitutional character

The psychological background is as important as the nutritional. All physiological processes are profoundly influenced by mental tone and health which readily excite or depress vitality in every organ with most widespread consequences. The bearing of this upon dermatological ills is appreciated if we recall the ease with which blushing and pallor sweating and goose-flesh skin, etc are evoked The intimate relationship embryologically of the skin and central nervous system has previously been stressed and accounts for a high proportion of functional disturbances in dermatological practice Every dermatologist should have some training in and experience of psychological medicine if he is to interpret and assess his field of practice accurately

Again, heredity and early life are important and the dermatological stigmata indicative of maladjustment in this regard are numerous The size of the family the character of the school life, the influence of parents and other guardians and relatives and the conditions under which the psychological stresses and strains of puberty are experienced should receive full consideration. The problems of adolescence, of matrimony

and childbirth and of the climacteric in both male and female are important and so are the relationships of the individual to his or her work to success or failure etc

Nervous shocks worry anxiety fatigue and nervous stress and strain are perhaps the most common influences bearing upon mental health and responsible for physiological disturbances of the type we are about to consider

Industry is responsible for a large group of skin diseases with particular characters and dependent upon contact with noxious substances These are dealt with in a separate chapter and more fully in works on occupational *diseases of the skin* *Apart from this however* the nature of a man s occupation may profoundly influence his health through the channels of nutrition and psychology already mentioned Thus miners may see little daylight work in a hot and abnormally dusty atmosphere and under considerable nervous strain

Industrial employees may be subject to boredom and monotony to fatigue and weariness from standing or strained postures Anxiety and irritation often enter into the picture from relationships with fellow workers and superiors and from fear of unemployment

Apart from irregularity of feeding the sandwich meal the effect of night shifts etc these psychological influences bear upon nutrition by *their effect* upon *gastro-intestinal function*

The occupation of a patient must invariably receive consideration in taking a history and assessing the factors bearing upon the etiology of disease and the doctor should make himself familiar with his patient s employment.

While the nutritional psychological and industrial are the three major influences bearing upon the affections dealt with in this section there are other *factors* which may upon occasion play a part Toxæmia arising from acute or chronic infection and sometimes from septic foci as in teeth tonsils etc should receive consideration more particularly in the erythematous reactions Specific allergic sensitisation to foodstuffs plants *animals toxins etc seems to be responsible in a further limited* group of reactions and especially in those associated with urticaria or œdema

The influences of endocrine and metabolic factors as in some seborrhœic disorders must also be mentioned

It should be emphasised that while any one or more of these factors may play a part in the etiology of any of the reactions to be considered in this section certain particular influences seem commonly to bear upon particular reactions Thus the psychological is most important in eczematous troubles the nutritional in seborrhœic toxic influences in the erythemata and climatic in psoriasis etc

ECZEMA

(Ck *ek* out *zeo* boil)

The term eczema is too deeply set in dermatological nomenclature to be uprooted and *there is no doubt that many dermatologists* have a clear concept of the uncomplicated condition The eczematous eruption primarily consists of grouped uniform pinhead sized lesions at first

PLATE II



CHRONIC SCALY ECZEMA OR DERMATITIS

There had been a short vesicular stage

[To face p. 11

erythematous later papular vesicular and eventually weeping The uniformity of the eruption no doubt depends upon the fact that it arises from the papillæ in which the capillary loops dilate and exude to produce microscopical vesicles becoming apparent as weeping points after scratching Where the epidermis is thick and horny as on the hands and feet individual lesions coalesce before reaching the surface and produce larger vesico-bullous lesions termed pompholyx When the eczematous eruption persists in a mild form it gives rise to a diffuse œdema of the epidermis (spongiosis) which results clinically in desquamation giving a scaly erythematous eczema. If this becomes chronic or is aggravated by much scratching the œdema and hypertrophy of the epidermis which results (acanthosis) is seen clinically as a superficial leather-like thickening of the skin with exaggeration of its normal lines (lichenification). The eczematous reaction depends upon a physiological hypersensitivity of the skin *i.e.* a predisposition inherited or acquired and upon an external agent the irritant of such an order as would not provoke inflammatory changes in the skin of the *normal* individual Auto sensitisation to the exudate or to cell products extends and maintains the reaction.

Naturally the eruption commonly arises as a result of the psychological stresses and external hazards of many employments, and in such cases cannot be distinguished from the group recognised as Occupational Dermatoses. In fact legally such cases have to be certified as " dermatitis produced by dust or liquids " or the subjects are not eligible for compensation, so that what is morphologically an eczematous eruption must be diagnosed as dermatitis

In the chapter dealing with inflammatory conditions of the skin resulting from external injuries it is suggested that it would be helpful to substitute the term " Eczematous Dermatitis (Plate 11) in order to avoid the difficulty of trying to differentiate between eczema and dermatitis and it is fundamental to a proper concept of this condition to appreciate that its appearance in all cases is indicative of an underlying constitutional predisposition and an external irritant factor At one end of the scale we meet cases like infantile eczema, where the problem is essentially a constitutional one and the external factor may be no more than friction on the part of the patient. At the other end we meet cases of dermatitis in which the external factor *i.e.*, an irritating dust or liquid, is the all important factor Between these two extremes varying degrees of constitutional predisposition and external injury combine to give a wide range of disorders. From this group of dermatoses we should therefore exclude as not constituting eczematous reactions —

(1) Gross traumatic dermatitis from external injury calculated to provoke inflammatory changes in the *normal* individual.

(2) Certain eruptions dependent upon infections of the skin, *e.g.* —

(i) Eczematoid ringworm of the groins and extremities (epidermophytosis, etc., see p 309).

(ii) Certain seborrhoeic affections thought to be dependent upon the pityrosporon and therefore relatively benign skin organisms (petaloid and pityriasiform seborrhoeic eruption of the trunk and limbs, see p. 201).

(iii) Certain scaly red sometimes glazed intractable inflammatory infections of the scalp retro auricular and circum-oral sites and flexures thought by some authorities to be *dependent upon* pyogenic organisms or monilia (streptococcic pityriasis of Haxthausen p 418 and infective seborrhoeic dermatitis and sycosis p 206)

It will be convenient to consider (1) local conditions which render the

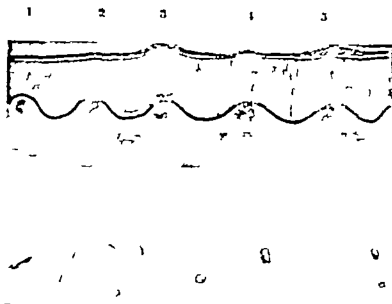


FIG 70 The stages of eczema (diagrammatic).
Stages 1 Dilatation of capillary loop in papilla of dermis.
2 Intercellular oedema of stratum mucosum.
3 Early papule
4 Microscopical vesicle
5 Weeping point

skin unduly sensitive and (2) general conditions which predispose to or directly cause the inflammatory reaction

Local predisposing causes —

(1) Excessive dryness of the skin This is best seen in xeroderma and ichthyosis These congenital conditions especially in their milder forms, are not at all uncommon They render the skin exceedingly sensitive to cold and damp and to easterly winds Xerodermatous patients usually come for treatment in the late autumn and winter months and often year after year *The dry atrophic skin of the aged is also specially prone to eczema*

(2) Excessive sweating of the hands and feet and in the flexures is a common cause of eczema Included in the eczema group is the vesicular affection of the hands and feet called dysidrosis or pompholyx This eruption is recurrent and occurs chiefly in the summer

(3) Excessive greasiness of the skin as in the seborrhoeic subject predisposes to eczema It is commonly associated with hyperidrosis and such patients are recognised as bad industrial risks in those trades carrying with them a dermatological hazard

(4) Chronic congestion as seen in the legs of patients suffering from varicose veins is a common condition predisposing to eczema

(5) Perniosis the chilblain type of circulation associated as it is with some chronic non-pitting œdema of the extremities and hyperidrosis renders the subject more liable to eczema.

It will be appreciated that occupations which cause excessive drying or degreasing or water maceration of the skin, favour the development of eczematous lesions.

General predisposing conditions —

(1) Heredity very definitely plays a part. Not only is it common to get a family history of eczema but other evidences of physiological instability in the family such as hay fever asthma, rosacea urticaria, etc., are the rule French authorities support the view of an inherited "exudative diathesis" being responsible for eczema.

(2) Age and sex are important factors, eczema being common in the infant and in the aged In infancy eczema is more common in the male than in the female.

Puberty and the menopause phases of marked physiological instability are also times of increased susceptibility to eczema

(3) General debility Physical nutritional and nervous debility are regularly present in these cases; indeed it is not too much to say that the majority of cases of eczema are no more and no less than an expression of debility General fatigue over work, worry anxiety and unhappiness are among the most common findings but poor or improper or irregular food often deficient in vitamins resulting in dyspepsia minor degrees of avitaminosis and anemia are also important. As major associated symptoms it is quite common to find insomnia, hypertension or anemia

(4) Diet. Gross indiscretions in diet, dyspepsia and constipation will undoubtedly aggravate but it is very doubtful if they are ever primarily responsible for eczema. On the other hand, considerable help in treatment is afforded by proper dietetic instructions though it is important to prevent the patient from becoming anxious and imaginative about the relationship of special foodstuffs to the eczema. This is dealt with later under treatment.

While our clinical experience has not supported the view that eczema results from autointoxication consequent upon constipation, or as the result of toxemia from focal sepsis, it is desirable that such disorders should be corrected and it is possible that they may on occasion be of major importance

Skin Tests Certain subjects give specific reactions to cutaneous protein tests, and extensive observations have been made to determine whether eczema is due to a sensitisation of the skin by certain foods. The results recorded vary widely Many individuals react to several proteins Our experience with that of others is that even when a protein reaction is obtained it is quite uncertain whether the removal of the incriminated article will be followed by amelioration of the eczema The practical value of these tests therefore is limited. With the exception of pompholyx from oranges we believe that eczema, infantile or otherwise, is rarely dependent upon specific sensitiveness to any ingested food. We have seen many cases declared proven by the allergists but their conclusions have been refuted by clinical investigation and treatment subsequently

(iii) Certain scaly red sometimes glazed intractable inflammatory infections of the scalp retro-auricular and circum-oral sites and flexures thought by some authorities to be dependent upon pyogenic organisms or monilia (streptococcic pityriasis of Haxthausen p 448 and infective seborrhoeic dermatitis and sycosis p 200)

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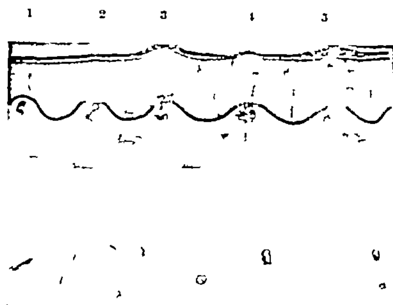


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the presence of imperfectly keratinised horn cells which retain their nuclei (parakeratosis) and adhere to the surface instead of being shed, causing the scales in squamous eczema. The clinical change is lichenisation or lichenification which may appear in papular form, prurigo (Lat. from *prurire*, to itch) where the eczema papules measure the size of a split pea, or appear as plaques or sheets of thickened leathery skin in which the normal lines of the skin are exaggerated and appear as furrows.

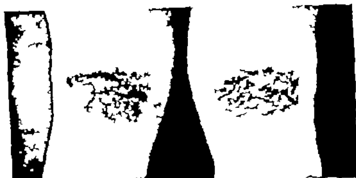


FIG. 72. Eczema (flexural type).

Clinical features. It has long been the practice to classify the types of eruption in eczema as erythematous papular vesicular and pustular. It is impossible to make this distinction arbitrary as the various stages may co-exist or the process may undergo modifications from time to time. The terms are however useful as expressing the chief characters.



FIG. 73. Infantile eczema (facial type), infected.

In **erythematous eczema** the lesions are ill-defined, bright or dull red spots or patches which unite to form diffuse areas. There is usually little oedema except in those sites where the connective tissue is lax, as about the eyelids or the scrotum and penis. The patient complains of heat and itching, but there is no pyrexia or disturbance of the general health as in erysipelas. The eruption gradually fades and is followed by a slight, usually branny desquamation. Erythematous eczema is very prone to recur and is often mistaken for erysipelas. It generally runs an acute course, but may pass into the vesicular or scaly form. Occasionally it becomes pustular

Pathological anatomy The essential part of the process is a spongy condition of the stratum mucosum due to intercellular œdema arising from the capillaries in the papillary heads (Fig 71) As soon as the tension of the serous exudate is sufficient to rupture the intercellular filaments, vesicles form containing sero fibrinous fluid and a few migratory cells The vesicles appear first in the deep part of the epidermis and gradually pass up to the corneous layer where they form the visible vesicles characteristic of one stage of the disease The after history of the vesicle varies Where the tension is slight the vesicle dries up and a minute crust or scale forms which ultimately falls off and the epidermis is soon restored But in many instances the vesicles rupture or are ruptured and from the well like cavities produced the exudation continues to pour out. This constitutes the condition known as weeping Owing to some

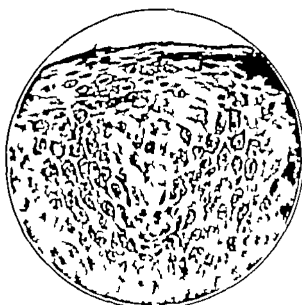


Fig 71 Early stage of eczema. Negative of section kindly lent by Dr Whitfield

defect in the process of keratinisation there is no tendency to rapid healing

In true eczema the vesicles are amicrobic at the start but they speedily become infected with micrococci which find the serous exudate a suitable culture ground When pyogenic infection occurs leucocytic infiltration rapidly follows The secretion then becomes turbid and purulent and the crusts which form by its desiccation are yellowish and comparatively thick

The eczema is then impetiginised

Defective keratinisation of the epidermis is another feature of eczema. It has already been mentioned as preventing the healing of weeping surfaces But the special change called parakeratosis (Gk *para* irregular *keras-atos* horn) in which the cells of the corneous layer preserve their nuclei is the cause of the desquamation in scaly eczema In chronic cases the œdema of the prickle-cell layer gives rise to cell reproduction above the basal-cell layer *i.e* mitosis occurs in the prickle cells This œdema and hypertrophy acanthosis (Gk *akanthos* thorn or prickle) is responsible for

the presence of imperfectly keratinized horn cells which retain their nuclei (parakeratosis) and adhere to the surface instead of being shed causing the scales in squamous eczema. The clinical change is lichenisation or lichenification which may appear in papular form prurigo (Lat, from *prurire* to itch) where the eczema papules measure the size of a split pea or appear as plaques or sheets of thickened leathery skin in which the normal lines of the skin are exaggerated and appear as furrows.



Fig. 72. Eczema (flexural type).

Clinical features. It has long been the practice to classify the types of eruption in eczema as erythematous, papular vesicular and pustular. It is impossible to make this distinction arbitrary as the various stages may co-exist or the process may undergo modifications from time to time. The terms are however useful as expressing the chief characters.



Fig. 73. Infantile eczema (facial type), infected.

In erythematous eczema the lesions are ill-defined, bright or dull red spots or patches which unite to form diffuse areas. There is usually little œdema except in those sites where the connective tissue is lax, as about the eyelids or the scrotum and penis. The patient complains of heat and itching but there is no pyrexia or disturbance of the general health as in erysipelas. The eruption gradually fades and is followed by a slight, usually branny desquamation. Erythematous eczema is very prone to recur and is often mistaken for erysipelas. It generally runs an acute course, but may pass into the vesicular or scaly form. Occasionally it becomes pustular

Papular eczema The lesions are round often acuminate papules of a bright red colour about the size of a pin's head In some cases the papule is capped by a tiny vesicle visible only under a lens The papules may be discrete or arranged in groups forming patches of various sizes When the lesions are closely set plaques may be formed which in chronic cases, undergo lichenisation This variety of eczema is attended with intense itching and the clinical features are often masked by the excoriations caused by scratching It frequently runs a chronic course and is rebellious to treatment

Vesicular eczema Usually begins acutely The skin shows a punctate

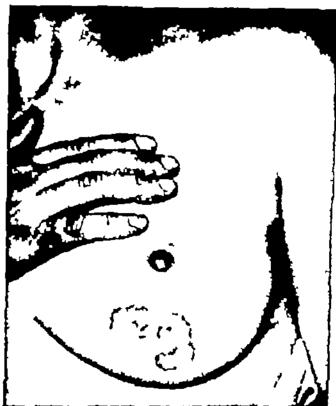


Fig 74 Vesicular eczema Circinate pattern.

erythema and a number of minute vesicles not larger than a pin's head appear The closely set vesicles soon coalesce to form larger lesions which rupture and a viscid serous fluid which stiffens linen escapes from a number of depressions which are the ruptured vesicles The exudate dries up to form yellowish scabs or crusts and under these the exudation continues The itching and burning diminish when vesication occurs Patches are *ill-defined except when circinate in pattern*

Vesicular eczema may occur on any part of the body In infants the areas affected are mask like the cheeks forehead and chin being specially involved The hands and feet and the flexures are common sites in the adult The itching and burning sensations lead to excoriation from scratching and in young children it is not uncommon to find extensive bleeding areas which have been denuded by *the nails (Fig 74)*

On the legs chronic vesicular eczema passes into eczema rubrum, and infection with pyogenic cocci commonly leads to the pustular variety

On the hands and feet a vesicular eruption between fingers and toes on palms and soles is described as pompholyx It is intensely irritable usually associated with increased sweating is common in hot weather and often nervous in origin though it may arise as a toxic eczematide eruption or from external irritants

Impetiginised eczema Secondary infection with pyogenic cocci produces the condition which has been termed "pustular eczema." The most frequent sufferers are children, particularly those seen in the out patients clinics in large towns The pustules form dirty yellow brown, or greenish-brown crusts The hairy regions of the body are the most frequent sites The glands are involved early

Eczema rubrum is an old name given to chronic red glazed inflammatory areas on the lower extremities in adults The affected part is of a bright red colour the skin is thickened and the whole limb is often swollen The corneous layer of the epidermis is absent, and the exudation may be either diffuse and hardly perceptible or clear yellow drops of plasma oozing out at various points Scabs and crusts of yellow colour are formed by the drying exudate Sometimes blood is mixed with the plasma The patients complain of severe burning and itching

Eczema madidans is the name given to constantly oozing red eczema.

Scaly eczema. This name is given to the scaly condition which follows the erythematous or vesicular eruption. It is also applied to a chronic form in which erythema with scaling is the chief feature The scales are thin flakes of a white or grey colour They differ from the scales of psoriasis in being easily detached and, moreover they are scanty and never silvery

The most advanced degree of scaly eczema is seen on the palms and especially the soles. Here the increase of the horny layer is so great that the mobility of the parts is impeded The surface is dry and rough, and movement causes the formation of deep painful fissures in the sites of the normal furrows of the skin.

Infantile eczema begins over the malar regions and extends to a mask distribution over the face The scalp and outer aspects of the limbs may be affected but flexual lesions are usual in chronic cases The distribution and extent are determined by friction and scratching It is more common in males and usually appears at about three months of age. The feeding of the babe rarely plays any part in the etiology

The affliction is the expression of a sensitive skin and of a sensitive and therefore bright, lively intelligent and alert child who is likely to outstrip his fellows in the battle of life provided he is not hampered by disabilities resulting from such reactions as the eczema

The eczema may be started from external irritation or exposure (as shown by Hall) or infection as impetigo or it may arise from some general internal upset and particularly from teething Once started the itching provokes severe rubbing and scratching and the habit is difficult to break. Furthermore any little upset or annoyance any departure from routine or any stimulus is likely to evoke a reaction of the same pattern once it has been learnt

The problem is essentially a physiological and psychological one from the start and the guardians of the child should be instructed in the absolute necessity of keeping the child as peaceful and quiet as possible It is equally important that in later childhood a quiet rather than a stimulating routine should be enjoined and undue pressure at school must be avoided

Reference—Barbara Woodhead "The Psychological Aspect of Allergic Skin Reactions in Childhood. 1946, Arch Dis. in Childhood 21, 98

Occasionally this same problem arises for the first time at puberty or later in life at some crisis instead of in infancy

Many authorities believe this trouble to be dependent upon allergic sensitiveness to foodstuffs or other substances but we cannot at all subscribe to this and invariably put these babes on the ordinary diet for infants of their age Sometimes it is advisable to remove the babe from the breast because the less intimate the relationship between the infant and his anxious mother the better Positive skin test reactions to cow s milk egg white and such like are often obtained but they seem to have no significance

Approached along these lines with proper co-operation from those caring for the babe results of treatment are good It is very important that recovery should be effected quickly for the longer the habit persists the more difficult it is to break

Some of these infants persist with chronic eczema in the form of Besnier s or Hebra s prurigo mentioned below

Lichenified eczema from the etiological point of view is essentially constitutional and dependent on physiological and psychological instability It may occur extensively as sheets or plaques of lichenification verging into simple eczema or normal skin or it may occur in circumscribed areas (lichen simplex chronicus of Vidal also described as circumscribed prurigo neurodermatitis or neurodermite) As has been described the whole skin is thickened and leathery and the normal lines of the skin are exaggerated into *furrows* The diffuse type is common in chronic eczema persisting from infancy or puberty and is known either as *Besnier s prurigo* or *Hebra s prurigo* In the former which is commonly associated with asthma lichenification is mostly flexural in the Hebra type mostly extensor and in both types outlying papules of lichenified skin the size of a pea (prurigo nodules) *occur They are very intractable are* associated with much nervous and mental instability and in the Besnier type are often associated with specific allergic sensitiveness to many allergens causing urticaria asthma etc The circumscribed *neurodermite* lesions commonly occur at the nape or lower sides of the neck flexures perineum inner thighs or about the ankles elbows knees *palms and soles*

Diagnosis The diagnosis of eczema is suggested first by itching and secondly by the characters of the eruption The primary eruption presents grouped *uniform* pin head sized lesions—erythematous papular or vesicular—except on the hands and feet where coalescence of individual lesions produces the condition of pompholyx. Later this may give rise to scaling areas or to sticky weeping patches which form thin yellow scabs

Lichenification—a diffuse leathery thickening of the skin with exaggeration of the normal lines—may also appear

While both weeping and lichenified reactions may occur in the same individual it is common to find one patient reacts always by the one or other type as though he were predisposed either to the wet or dry pattern of reaction and this may be an explanation of the old classification of eczema into wet and dry types

It is necessary to take a careful *history* making special enquiry as to heredity the association of such conditions as asthma hay fever urticaria etc. demanding scrutiny The next point is to determine if possible for it may be very difficult whether the eruption may be due to one or more of the many irritants discussed in Chapter XVII Not only is it necessary to get information as to the exact nature of the patient s occupation but as to his hobbies such as gardening photography etc

Differential diagnosis Acute erythematous eczema—especially that type of " contact dermatitis " arising from specific sensitisation to some external agent—is often confused with *Erysipelas* Actually there is no fever or severe general disturbance and the itching is intense in eczema. The acute diffuse manner in which the eruption arises is also unlike the course of erysipelas

In considering differential diagnosis we may first take those affections in which itching is a presenting symptom and we find there are very few common affections of which this is true

(1) *Itching eruptions* First come parasites and particularly *scabies* This should be the first thought with any itching affection and it is readily excluded by the characteristic sites of the discrete papular or vesicular or " burrow lesions of scabies Lesions between the fingers, about the axillary folds and genitals are most helpful.

Second in this group are the toxic affections chiefly *urticaria* but the presence or history of wheals quickly establishes that diagnosis

Thirdly *lichen planus* may be but is not invariably a markedly itching eruption. It may be impossible to differentiate between diffuse plaques of lichenified eczema (circumscribed prurigo or neurodermatitis or nevrodermite) and sheets of lichen planus. The ordinary eruption of lichen planus however is distinctive in its violaceous colour its flat topped, burnished shining papules and in the frequent presence of lichen planus on the buccal mucous membrane

Lastly acute vesicular eczema may especially if patchy suggest *dermatitis herpetiformis* at first sight. The long history with recurrences the herpetic grouping of lesions the presence of other manifestations especially urticaria, the characteristics of the vesicles, the relief effected by their rupture and the high percentage of eosinophils in their fluid are some of the points which will help to confirm the diagnosis of dermatitis herpetiformis

(2) *Scaly and scabbed eruptions* constitute the second group to be differentiated from eczema. *Seborrhoic* pityriasis of the trunk and limbs tends to affect the mid-chest and back and the flexures and may be associated with a scurfy scalp. It may spread round the lines of the ribs to the flanks and individual patches may closely resemble a patchy scaly eczema. The latter is generally much more irritable and primary eczematous lesions may be found elsewhere.

Seborrhoeic pityriasis tends to have a more greasy scale and is relieved by mild sulphur ointments

In *eczematoid ringworm* the lesions are as a rule sharply defined but the simulation is very close Chronic recurrent eruptions of this type occur in the groin and axilla and between the toes Search should be made for fungus in all doubtful cases (see p 390) Itching may be present and is often severe

Psoriasis is rarely to be confused with eczema because of the characteristic silvery scale colour definition and distribution of the affection Itching is not common

Mycosis fungoides often presents an itching eruption which appears to be compounded from the lesions of eczema and psoriasis However the disease is too rare to cause much difficulty (see p 135)

Impetigo—except a fine phlyctenular impetigo of the face—presents larger varying sized lesions irregularly disposed with stuck-on scabs Itching is absent or negligible

(3) *Eczematous eruptions of the hands and feet* assume a variety of patterns The type described as pompholyx—showing fine sago-grain, deep seated vesicles along the sides of fingers and toes and in the palms and soles with occasional coalescence of lesions to give irregularly sized vesicles and bullae—is generally a constitutional affection It occurs in nervous subjects showing hyperidrosis and is common in hot weather and in states of debility It is sometimes provoked by external irritants but this generally gives a more superficial diffuse and larger vesico-bullous eruption with eczema of the backs of the fingers and hands and elsewhere

A vesicular toxic *erythema multiforme* occasionally affects the hands and feet profusely giving a pompholyx type of eruption Target lesions elsewhere and lesions about the lips and mouth will often be present

Scabies affects the palms and soles more particularly in infants The lesions characteristically lie in the lines of the palms (p 339)

In ringworm of the feet the acute manifestation is a vesicular eruption and the fungus may be demonstrable in the epidermis forming the roof of a vesicle In the chronic form the skin in the outer cleft between the little toe and the next is thickened and sodden and tends to crack and itch Fungus can be demonstrated in scrapings from this site

Distant foci of infection including chronic ringworm infection of the toes (epidermophytosis) may give an allergic eczematide of the hands of the pompholyx pattern This is one important reason why an examination of the feet should never be omitted in eruptions of the hands

Papular and dry scaly and fissured eczema of hands and feet may result both from internal and external causes though there is generally some nervous constitutional background They are often obstinate recurrent and very irritable affections and are common in both men and women about the forties and fifties Sometimes the horny overgrowth and fissuring is extreme and most disabling and it is not uncommon to find associated hypertension and insomnia in these cases

This state has to be differentiated from tertiary lues (which commonly affects one palm or one sole only) and from psoriasis lichen planus lichen simplex and arsenical keratosis (generally associated with embedded warts)

Prognosis As a rule eczema may be looked upon as curable but it is often exceedingly tedious and tries the patience of the sufferer and the medical attendant. Where the underlying cause can be attacked and removed the outlook is favourable but in all cases there is a great tendency to recurrence A great deal depends upon the co-operation and understanding of the patient who ultimately must cure himself if he is to be cured

Sudden death may occur in eczematous infants without adequate cause the post-mortem findings usually being a mild bronchopneumonia or gastroenteritis Owing to the greater risk of infection in hospital the admission of such cases should not be encouraged.

Treatment of eczema and eczematous dermatitis. *Prophylaxis* Certain local conditions are known to predispose to eczema. Attention to these may prevent an outbreak. For instance the xerodermatous skin can be kept supple and in a less vulnerable condition by the daily application of glycerine and water The more severe forms of ichthyosis usually require an oily preparation, and we have used with advantage liquid paraffin or vaseline or equal parts of olive oil and lanolin. Persons who are susceptible to "chapping" should be very careful thoroughly to dry the hands and especially the wrists after washing and the commonly used glycerine is distinctly prophylactic Where constant washing is necessary from the avocation of the patient, equal parts of glycerine and lotio rubra make a suitable application. The use of "barrier creams" to protect the skin from irritation from frequent washing or irritants will be mentioned under industrial dermatitis (p. 351).

In certain subjects soap should be sparingly used and the super fatted basic soaps will be found of great service In some individuals soap has to be forbidden at least for a time and fine oatmeal is a valuable substitute Hard water is also to be avoided by those who are prone to eczema.

Varicose veins must receive attention. The limbs should be supported by a properly fitting bandage General maintenance of good physical and nervous health, avoidance of dietetic indiscretions, of undue fatigue excitement worry etc are important in view of the high incidence of eczema in states of debility

In a declared case the affected part should if possible be placed at rest. A case of widely-spread eczema should be treated in bed. This not only allows of satisfactory dressing of the lesions but ensures rest. Every source of irritation must, of course be removed. The affected parts may be cleansed with saline and soap may be applied sparingly to them. In some cases sterilised olive oil may be used as a means of cleansing as a temporary expedient.

Diet The diet in eczema should be simple. In acute widespread cases it is often helpful to put the patient on a diet consisting of milk. In the more chronic and localised cases more latitude is allowable All twice-cooked meat entrées and made-up dishes should be avoided, and condiments, spices, curries and fried foods should be stopped entirely Salted meat and fish should not be taken, but fresh fish may be allowed. Alcohol should be excluded in all acute cases but the chronic conditions are not adversely influenced by weak alcoholic drinks. If there be glycosuria Bright's disease or gout the diet appropriate to these conditions must be

rigorously enforced In acute exudative cases a higher protein diet is of value Meat fish, fowl and eggs and fresh foodstuffs generally are allowed carbohydrates and fats are restricted and fluids reduced to about two pints daily salt is avoided

This diet is supported by vitamins and the administration of a mixed mineral mixture as the following the effect of this *régime* being to reduce the water content of the tissues and this renders them less catarrhal and reactive —

R Potass bicarb
Potass citrat ää grs xxx.
Calc lactat
Magnes carb., ää grs v
Syr aurant., ♏ xxx
Aq chlorof ad oz. ½ t d s a c
Ft mist

A watch must always be kept for states of anæmia and malnutrition which must be treated along the recognised lines

While on the subject of diet the general care of the bowels should be stressed It is as harmful to purge unduly as it is to allow constipation. A routine in the adult of calomel gr ¼ or less at night and a little saline aperient in the morning is wise in children hydrarg cum creta or a rhubarb and soda mixture serves the same purpose

Internal treatment There is no specific internal measure for eczema but it is essential first that the itching be relieved secondly that the whole constitution and the skin be rested and thirdly that the patient should sleep

All these ends are achieved by the administration not of sedatives as such but of sedative-tonic measures The mental effect is of first importance and the mere doping of a patient though it may produce a few hours sleep will effect no refreshment mentally or temperamentally and is very likely to impair vital processes of repair and healing It is our experience that if a patient is conscious of a soporific effect from measures of this type the dosage of sedative is too great and the result will be unsatisfactory—the effective dosage to relieve itching and improve tone is below the sedative dosage

The necessary dosage is less in the more intelligent and sensitive than in the less sensitive The most valuable measures are phenobarbitone gr ½ o.n or b d or t d s or either of the following mixtures —

R Pot brom gr x		R Quin sulph gr ii
Sp ammon arom ♏ xv		Ac hydrobrom dil ♏ xxx
Tr nucis vom ♏ iv	or	Glycerin ♏ x.
Infus gent ad oz ½		Aq chlorof ad oz. ½
Ft mist		Ft mist

Sedatives should not be given merely at night but if the patient does not rest adequately on these measures then aspirin gr x or an extra gr ½ of phenobarbitone may be given Eczema assumes abnormal proportions in the still of the night *if the patient is sleepless and in very difficult cases* full doses of morphia and scopolamine may be employed A valuable effect of treatment *along* sedative-tonic lines if the proper assessment of the

problem and approach to the patient has been made is the re-establishment of confidence in the patient.

In infants and children the dose of bromide or luminal necessary is relatively much larger. Less than gr. v of potassium bromide t.d.s. should never be given to an infant with infantile eczema no matter how young. Apart from being useless small doses of bromide are liable to produce bromide granulomata. The bromide may be given in a mixture thus :—

℞ Pot. brom. gr. v.
Pot. cit., gr. vii.
Syr. rhei., ♏ xv.
Syr. aurant. ♏ xxx.
Aq. chlorof. ad dr.ii t.d.s.p.c.
Ft. mist.

We have not found phenobarbitone so valuable in infants as in older children and adults. Less than gr. ¼ is of no value in children with eczema and bromide or syrup of chloral is more effective.

It is often advisable in dealing with chronic cases both in children and adults to continue phenobarbitone gr. ¼ at night for some months after the affection has cleared.

Arsenic, antimony, quinine or valerian as such have not, in our hands, been of great value. Sometimes tr. belladonnae may advantageously be added to the sedative mixtures and a combination of phenobarbitone, atropine and ergot (bellergal) has a useful synergic effect in some obstinate cases. The essential requirement is a sedative specific to the vegetative nervous system.

Spas. In chronic cases in the well-to-do one is often asked as to the advisability of visiting some spa. The most important part of the spa treatment is the regular living and the general routine. These are doubtless of more importance than the actual taking of certain waters. In the overfed and constipated the regular aperients taken in the waters are of great value and many persons find benefit from the sulphur waters of Harrogate, Strathpeffer and Llandrindod. In other cases the alkaline waters of Royat and Vichy are of more benefit. As a rule cases of eczema do not do well at the seaside but where the underlying cause is overwork and want of rest the tonic effects of the sea air are beneficial.

Local treatment. The local treatment of eczema and of dermatitis due to irritants is on the same lines. It is, of course, essential that the irritant, if known, should be removed. Where the patient's work is the exciting cause he must be removed from it, if possible.

Local treatment should be soothing and protective. Too much emphasis has, in the past, been laid on the necessity for cleaning up affected parts and removing infection. Most infection is saprophytic and most crusts are removed by Lassar's paste.

In severe cases removal of scabs and crusts is best effected by means of the boric-starch poultice. One teaspoonful of boric acid and half an ounce of starch are mixed into a paste with a small quantity of cold water. Upon this is poured 15 ozs. of boiling water and the whole is well stirred. The application is spread upon butter muslin and applied cool to the affected part. It is best to keep the muslin in position by a thin bandage. The poultice softens the crusts and permits of their easy removal. Poultices

here very small doses often help A fractional dose 70 r to 150 r is given on three or four occasions at intervals of two to three weeks It is most effective in relieving irritation and promoting healing

For *chronic eczema with painful fissures* daily painting with a solution of silver nitrate ten to twenty grains in seven drachms of spiritus aetheris nitrosi and one drachm of water is often valuable The edges of the painful fissures of the finger tips are frequently thickened and horny This type of eczema and chronic circumscribed patches of lichenified eczema (lichen simplex chronicus or neurodermite) are greatly helped by X ray therapy but will also respond frequently to painting with crude coal tar Should the patient be obliged to work the finger tips should be protected by strips of Mead s strapping applied to form a cap or by filling cracks with Duraflx.

In some cases patches of eczema of the chronic type cannot be influenced by the soothing remedies above mentioned There may be some under lying general or more probably some local condition which has been over looked Varicose veins especially of the finer variety where there are numerous small varices require attention

Pompholyx

(Gk., a bubble)

An acute or subacute eruption of vesicles or bullæ occurring on the hands (cheiropompholyx) and feet (podopompholyx) and often associated with excessive sweating Since the vesicles are not histologically related to the sweat ducts the conditions mentioned are not the result of dyshidrosis

Etiology The pompholyx type of cutaneous reaction occurs in the following circumstances —

(1) From fungus infection—Eczematoid ringworm of the extremities (p 300) and the vesicular ide eruptions

(2) From chemical irritants (p 519)

(3) Idiopathically A neurogenic vesicular eczema of the hands and feet The term cheiro or podopompholyx should be reserved for this idiopathic type The hyperidrosis is merely a sign of the neurogenic basis of the condition and any eczematous reaction is more likely to erupt on a hot sweaty skin

(4) In toxic states associated with acute febrile illnesses, tonsillitis or influenza

(5) Rarely by the exhibition of drugs *e g* iodide

The disease is more common in wom n than in men It often begins about puberty or early adult life It is generally said that the patients are neurotic and overworked In a few instances local irritation appears to be the exciting cause for instance the use of antiseptics by medic l men and nurses Spring and summer are the seasons in which pompholyx occurs and it often returns year by year about the same time Siccole made 200 cultures from 27 cases of pompholyx with negative results

Pathology The lesions are rounded cavities in the corpus mucosum produced in a similar manner to the vesicles of eczema *i.e* by spongiosis They do not arise from the sweat ducts and their contents are clear fluid highly albuminous with migratory cells There is little doubt that pom pholyx is a form of eczema with peculiar local characters As already

indicated, some local irritants in predisposed subjects produce a condition identical with pompholyx, and recent observations have shown that at a certain stage eczematoid ringworm of the extremities may produce a clinical picture which is identical with pompholyx with its peculiar tendency to recurrence in certain seasons. This eruption is usually an epidermophytide and unlike true cheiropompholyx it clears up spontaneously when the ringworm infection is eradicated.

Clinical features. There are sometimes general symptoms which seem



FIG. 74. Pompholyx.

far out of proportion to the local character of the eruption. The patient complains of malaise, depression and sensations of heat and cold. These symptoms and burning and itching and sometimes actual pain in the hands, usually precede the cutaneous manifestation. The lesions themselves are small, deeply-placed vesicles in groups or lines in the interdigital spaces, along the sides of the fingers and on the palms, rarely on the backs of the fingers. They have been likened to boiled sago grains embedded in the skin, and the simile is an apt one. On the palms there is often excessive sweating, but this is by no means constant. Very often the vesicles in the palms are so deep that they merely produce flat elevations of the surface which do not obviously contain fluid. In many cases the vesicles along the sides of the fingers and in the clefts and elsewhere tend

to coalesce and form definite blebs There is no tendency for the blebs and vesicles to rupture but when pricked they exude a clear alkaline fluid. In ten to fourteen days they dry up and desquamation occurs. Relapses are very common The feet are often similarly involved or may be affected alone *i.e.*, podopompholyx The eczematous eruption may spread to the forearms and appear on the trunk. When the eruption spreads to the forearms the lesions are those of a vesicular eczema which confirms our etiological concept of pompholyx. Eczematous lesions may also appear on the body and lower limbs. Impetiginisation of the lesions from scratching is not uncommon and acute pyogenic infection with ascending lymphangitis fever and malaise may occur but will usually quickly respond to moderate doses of sulphonamides.

Diagnosis The lesions in the interdigital clefts may be mistaken for scabies but there are no burrows, and the eruption is usually limited. Care must be taken to eliminate the eczematoid ringworms which occur on the hands and feet In practice this may be far from easy and it may be necessary to make many examinations to be certain that the condition is not caused by fungus. Whether the similar eruption occurring from local irritation should be classed as pompholyx or eczematous dermatitis is a matter of little diagnostic import

Treatment. As in other eczematous conditions sedatives and emollients are indicated Small doses of phenobarbitone are invaluable or tr belladonnae ♏v–x in a bromide mixture may be tried At the same time the temperamental make-up of the patient and environmental factors at home and at work should be considered and adjusted if possible

X ray therapy doses of 50–100r repeated in two to three weeks, for a total irradiation not exceeding 300r is most useful

Bland lotions of lead calamine tar solution and the dyes should be tried first proceeding to emollient creams if the skin is too dry An acid lotion containing boric acid gr 5 tannic acid gr 20 in water to one ounce has proved useful when hyperidrosis was present

CHAPTER VIII

NEURODERMATOSES

PRURITUS AND PRURIGO LICHEN SIMPLEX

(Lat. *prurire* to itch)

Itching is excited in everyone by some forms of irritation, but the intensity of the subjective phenomena varies a great deal in different subjects. What would excite an uncontrollable desire to scratch in one person causes very little discomfort in another Use dulls the sensibility and may explain the tolerance of the tramp to animal parasites, a tolerance which is inconceivable to a person of cleanly habits. On the other hand, some persons are morbidly sensitive and suggestion, even the thought of one of the common parasites, is followed by a sensation of itching In practice it is not uncommon to meet with an actual obsession, a parasito-phobia.

Contact with the hairs of the stinging-nettle or hairy caterpillars, the peregrinations and bites of the flea, louse or bug, and the presence of the acarus scabiei in burrows in the skin all cause intense itching In these cases the pruritus may be looked upon as physiological, scratching being the natural defence of the organism against intruders.

Mellanby's observations suggest that in the case of scabies itching is the result of a specific sensitisation to the saliva or some product of the acarus, and this is undoubtedly so in the reaction of the skin to the bites of the bed bug, louse, midge and mosquito. Individual sensitivity to such bites varies greatly and when a high degree of immunity is acquired further bites may not give rise to itching and this is probably the true explanation of the tolerance to parasites above mentioned.

In many healthy persons exposure of the skin to the air especially if the parts have been compressed by the corset, garters, etc., may cause evanescent pruritus.

Itching again, is a frequent symptom of certain cutaneous diseases and may precede or accompany obvious changes in the integument. It is most common in eczema, urticaria, lichen planus, pityriasis rosea, dermatitis herpetiformis, mycosis fungoides and leukæmic eruptions and in some drug rashes.

The act of scratching itself may induce pruritus in the area scratched or in some distant part, and it may be difficult to determine how far the itching is primary or secondary

Pruritus

The name pruritus is given to itching which is not accompanied by any obvious changes in, or disease of, the skin other than those changes provoked by rubbing or scratching. It may be local or general.

Etiology Pruritus is most common between the ages of thirty and forty but may occur at any age; both sexes are equally affected. There is often a history of neuroses of other kinds in the family and some races

are more affected than others Pruritus is very common in the United States, and among the Jews

Predisposing causes Some cases appear to depend upon seasonal variations, and upon climate The subjects of pruritus are often worried, anxious overworked or melancholic—the type of "neurotic met with in our large cities In other cases the predisposing cause is obesity excess of nitrogenous food or the abuse of alcohol tea coffee or drugs, such as cocaine and morphia

The circulation of toxic bodies in the blood may cause pruritus. It is a common feature in gout jaundice and some forms of uræmia, and may be associated with glycosuria dyspepsia and constipation Pregnancy and uterine and ovarian disease are sometimes accompanied by local or general pruritus, and the phenomenon may be toxic or reflex Leukæmia and similar grave blood diseases may be accompanied by intense pruritus. Itching is also met with in Graves disease

Itching is also an occasional symptom of organic disease of the nervous system e.g., tabes, general paralysis, hemiplegia and cerebral tumour

Exciting causes Nearly all forms of pruritus are made worse and some are distinctly excited, by exposure of the skin to the air by changes of temperature and hot or cold baths In all cases pruritus is apt to be accentuated by stimulants such as strong tea coffee and spirits or highly seasoned foods which tend to cause some dilatation of the peripheral vessels and may aggravate attacks. Certain drugs, such as cocaine and morphia are known to give rise to intense pruritus. In others certain articles of diet shell fish condiments, spices, even cheese are the excitants But in many of the most intractable cases no exciting cause can be traced, and the attack may waken the sufferer from an apparently sound sleep

Symptoms Pruritus is essentially subjective and examination reveals nothing but the evidence of scratching In a characteristic case of the severe type the patient is seized with an intense desire to scratch. He may make heroic endeavours to control this desire but usually without success Pressure friction or the application of heat or cold may be tried with little or no relief and finally the sufferer gives way and tears and mutilates the itching areas of skin with his nails In a few cases an attempt is made to dig out the offending spots we have seen this most marked in the pruritus of leukæmia but it is not confined to this condition.

The excoriations produced by scratching are usually linear but punctate lesions are not uncommon Infection of the scratch lesions by pus-cocci leads to impetigo and enlargement of the neighbouring lymphatic glands In chronic cases an eczematous dermatitis is produced or the parts may undergo lichenification

An attack of pruritus may last from a few minutes to several hours, and there is a tendency for the itching to return exactly in the same position after an interval

Generalised Pruritus

Where the itching is general the first essential in practice is to exclude the presence of parasites and careful examination should be made for scabies and pediculosis. Secondly consider and inquire about urticaria for the patient may not present wheals on examination Next it is important to

inquire as to constipation and dyspepsia, to examine the urine for albumen and sugar and to inspect the patient in a good light to avoid overlooking jaundice. Hyperglycæmia without actual glycosuria has been present in some instances. In the female pregnancy and ovarian disease may be the cause of the pruritus, and these require careful inquiry and examination. The nervous system must not be forgotten, for itching is an occasional symptom of tabes, general paralysis etc. Mycosis fungoides must be remembered as a cause of severe and persistent itching of the skin, which may long precede the evolution of the characteristic tumours. The possibility of the pruritus being due to leukæmia necessitates the examination of the blood.

Graves' disease and lymphadenoma may also be causes of general pruritus.

In true senile pruritus the skin is dry, inelastic and withered (*vide* p. 660). There may be very little evidence of scratching, for the senile skin appears to be unusually resistant. Arterio-sclerosis affecting the central nervous system probably accounts for some of these cases and pruritus may accompany hypertension.

Nervous strain, worry, anxiety, fatigue and general debility, anæmia, avitaminosis are common contributory causes, but often pruritus, both generalised and localised, is to be regarded as a psychoneurosis and the patient handled accordingly.

The *prognosis* depends upon whether the cause can be found and removed. In the true senile type treatment has little influence.

Treatment. The remarks made above emphasise the importance of treating the cause. The parasitic forms of pruritus are dealt with elsewhere. Glycosuria, renal disease, and other general affections are treated on the usual lines. If no definite cause can be found, the diet should receive careful attention. Probably any change in diet is helpful. Sometimes a pure milk diet or a diet of milk and vegetables may be prescribed, at other times a high protein diet with restricted fluids, carbohydrates and salt gives some relief. Strong alcoholic drinks should be forbidden. Tea and coffee are also better avoided. The bowels should be regulated, and the condition of the teeth should be carefully examined, and, if necessary, the aid of the dentist should be invoked. In nervous subjects, rest, avoidance of worry, residence in the country or by the sea should be obtained if possible. In hospital practice a few weeks in the wards produce a remarkable improvement, which unfortunately often disappears on the patient's returning to the usual routine of life. Lumbar puncture has been advocated by some authors and auto-hæmotherapy (the removal of 10 c.c. of blood from a vein and its immediate injection into the buttock) has its advocates. In those subjects in whom no particular cause is apparent and they form the majority of patients suffering from "primary" pruritus, it is important to realise that cure can only be effected by conscious or sub-conscious psychological adjustment. The doctor must scrupulously avoid any suggestion that such cases are hopeless or "difficult" and should direct his attention to general sedative tonic treatment rather than to frequently changed local applications. Bromide in a mixture, vitamin B_1 (3 milligrammes of aneurin twice a day) and general tonics are of service. Small doses of antimony wine and aspirin are frequently helpful. Morphia

and cocaine whether administered internally or applied locally must be banned entirely. Sedative tonic measures—fractional doses of phenobarbitone or bromide with strychnine and gentian—are most helpful. It is very material to his improvement however that the patient should understand the nature of his trouble and realise that it is a reaction to stress and strain, for only so is he able to help himself. Serious cases which fail to respond to such measures may demand the aid of a psychotherapist.

Local treatment. Bran, gelatin, oatmeal, sodium sulphate or tar extract added to the bath, or weak alkaline baths, sometimes give relief. Tepid and warm douches applied to the affected parts daily for five minutes are also advocated. The patient must not rub his skin vigorously with a rough towel after such treatment. Static electric baths and high frequency treatment may also be tried. In some cases short exposures to X rays or Grenz rays every fourteen days relieve the itching remarkably. Tar and lead lotion, carbolic acid 2 to 5 per cent, salicylic acid, 2 to 10 per cent, chloral hydrate 2 per cent, resorcin 2 per cent, and menthol, 2 to 10 per cent., may all be tried and it is often necessary to change the application from time to time. To protect the parts from air, plasters, pastes, and varnishes (see Formulæ) may be applied. Local anæsthetics should be avoided.

Local Forms of Pruritus

The localised varieties of pruritus have the same significance as general itching and the remarks in preceding paragraphs apply equally to them. In practice it will be found that some local factor directs the patient's attention to a particular area. There may be associated leucodermia.

Pruritus ani. Itching at the anus is the commonest form of local pruritus. The parts affected are the anal canal and a circumscribed area about an inch wide around the orifice. The itching is often intense, and may lead to extreme nervous depression and melancholia. The peri-anal skin is often severely excoriated by scratching and may be in an eczematous condition with radiating fissures. This eczematous eruption may extend forwards into the perineum and backwards into the gluteal cleft. In long standing cases the skin becomes thickened, rough and parchment like, either diffuse or localised as lichen simplex.

Ætiology. Pruritus ani is more common in the male than in the female. It may occur at any age from local causes, but the peculiarly intractable neurotic form is most frequent in middle life and in old age. The local conditions which may cause itching must be carefully considered before any case is classed as being neurotic, though the great majority of cases are of this class. They are: (1) Thread worms, which are the commonest cause of itching in this region in children, but pruritus due to them is rare in adult life. The impregnated female migrates out of the anus and lays her eggs in the natal folds. The developed eggs are commonly carried by the fingers to the mouth. They are hatched in the bowel and become mature in the large intestine. The cycle of development is two weeks. (2) Hæmorrhoids, fissures, polypi. A careful examination will often show that there are small superficial fissures or ulcers between the corrugations which are present in the skin of this region. (3) Chronic proctitis, with irritating discharges. (4) Chronic constipation, which may cause irritation by con

gestion and by the passage of hard scybalous masses. (5) Pelvic tumours also cause chronic congestion. In the female the presence of glycosuria or leucorrhoea may start a vulval irritation, which spreads to the anal region. Infection with trichomonas vaginalis may be an exciting factor (6) Skin diseases *e.g.*, tinea lichen planus psoriasis seborrhoeic dermatitis and morphoea

The general conditions requiring attention have been previously enumerated.

The *prognosis* depends upon whether the local or general condition causing the pruritus can be removed and upon the psychological response of the patient.

Treatment. It is important that the parts should be carefully cleansed after defæcation. This is best done with a pad of cotton wool wetted with 1 per cent. solution of glauber salt, using a little carbolic soap and followed by the application of 2 per cent. of phenol in liq hydrarg perchlor After careful drying a powder containing equal parts of zinc oxide and starch or talc should be applied. The addition of calomel (25 per cent.) to this powder is often of great service. If there is much thickening of the skin benefit is derived by painting the part with pure carbolic acid, which causes exfoliation, and leaves a superficial denuded area, which heals up rapidly under Lassar's paste (zinc oxid. 24 parts, starch 24 parts, acid salicylic 2 parts, vaselin 50 parts). The patient should remain in bed until the parts are healed. If there is eczematisation or infection with pus-cocci, a 2 per cent. aqueous gentian violet paint or a 1–3 per cent. solution of silver nitrate is useful.

In the neurotic cases the patience of the sufferer and of his medical attendant is sorely tried, and the large number of remedies suggested is evidence of the intractable nature of the affection. In some instances greasy applications appear to be irritant in others they are the only form tolerated. In mild cases Lassar's paste or a zinc ointment with a little salicylic acid (2 per cent.) is useful. In others carbolic acid (1 in 20) in vaselin, menthol 2 to 10 per cent., weak tar or ichthyol ointments may be of service. The application of a sponge wrung out in hot water and applied to the part will sometimes give the patient sufficient relief to ensure sleep. Anæsthetic ointments should be avoided.

Great benefit is often obtained by the local use of the high-frequency electrode. Without question the most valuable local application is unfiltered X ray therapy in fractional dosage at monthly intervals, care being taken to protect the scrotum from the rays. Unless combined with proper general and local treatment the measure may—and often does—prove futile; when taking its proper place in the management of the case as a whole it is, however invaluable. Grenz rays (300–600 *r*) sometimes succeed when X-rays fail.

The local conditions mentioned under etiology must be dealt with by appropriate measures. Thread worms are best treated by directing attention to auto-infection, such as wearing gloves at night, careful cutting of the finger nails, and calomel or white precipitate ointment should be applied at night. Quassia enemata and keratin-coated quassia pills (grains) are also of service and the insertion of a medicated suppository often affords rapid relief of pruritus beginning in the anus.

General treatment Apart from dietetic control the avoidance of strong alcohol and care of the bowels it is usually wise to prescribe calomel gr ¼ at night—as an intestinal antiseptic and corrective—and aspirin gr x at night or twice daily Aspirin is most valuable in directly relieving the pruritus but in nervously debilitated subjects sedative tonics as bromide with strychnine and gentian may be desirable in addition. General tonic treatment and the avoidance of worry with a change to the sea or a sea trip are of value in debilitated nervous subjects Hypnotic suggestion has been tried with success in some cases and may be combined with full doses of omnopon and scopolamine

A proper understanding by the patient of the significance of emotional and nervous factors and of the importance of habit in relation to pruritus ani is essential if treatment is to be effective

The *injection of local anæsthetics or excision of the peri anal skin with* undercutting of the surrounding integument has been attended with success in some cases, but we have seen many instances in which the relief was merely temporary and these surgical measures are not recommended

Pruritus vulvæ is another common and most distressing form of local pruritus. It may be associated with a similar condition at the anus or be independent of it Glycosuria may be a cause and the irritation of thread worms and trichomonas infection must not be forgotten Local irritation by vaginal discharges must be looked for and failing evidence of this, the condition of the uterus, ovaries and tubes must be investigated. Pruritus vulvæ is a common phenomenon in pregnancy *and is then* apparently due to congestion In some women there is pruritus at the catamenia, and it is common at and after the climacteric which supports the view that some obscure ovarian dysfunction is a factor in some cases The irritation may lead to masturbation and it is believed this practice may cause the pruritus Eczematisation of the parts may be induced by scratching and local infection with pus organisms.

As in pruritus ani some of the most intractable cases show no evidence of local disease and a careful examination reveals nothing but the evidence of scratching There is the same underlying neurotic condition and the *same mental depression and tendency to melancholia* The pruritus is rarely constant but there are attacks of intolerable itching when warm in bed or on taking exercise

The following skin diseases of the vulva are usually associated with pruritus lichen planus, lichen sclerosus, psoriasis, seborrhœic dermatitis morphœa mycotic infections, leucoplakia and kraurosis. They require treatment appropriate to the disease

The *prognosis* depends upon the recognition and appropriate *treatment* of the local causative conditions upon the psychological background and upon the ability of the physician to maintain the patient's confidence

The *treatment* is in some respects on the same lines as that of pruritus ani The high frequency treatment is sometimes useful and great relief may often be obtained from three or four applications of X rays (50–100 r once a month) Grenz rays in doses of 300 r are also of value

Simple cooling lotions of lead or liquor hydrarg perchlor with the addition of 2 per cent. phenol or liquor picis carb are most useful and the watery solutions of the dyes may be used if infection is present Creams

and pastes may be indicated if the skin is dry and cracks but grease is apt to increase the heat and irritation.

The general treatment is that indicated in pruritus ani.

In menopausal and post menopausal cases ovarian follicular hormone or stilboestrol in 0·5 milligramme doses daily for ten days each month is sometimes highly successful.

In some cases excision of the itching area has been performed. The results are occasionally satisfactory but we have seen cases in which the pruritus has returned, and excepting those associated with a precancerous leucoplakia when X-rays are contra indicated, surgical measures should be avoided.

Pruritus of the external genitals in the male is not so common as in the female It may be the result of glycosuria, and of urethral and prostatic affections, which require careful examination. A scrotal dermatitis in elderly men due to dribbling of urine may closely simulate the eczematisation of a pruritus. The perineum and scrotum may be involved as an extension of pruritus ani and should be treated on the same lines.

Pruritus of other sites. Pruritus sometimes occurs about the *nose* in association with intranasal conditions, naso-pharyngitis, etc. Dental caries and buccal sepsis, toilet and cosmetic preparations may cause similar irritation about the *mouth* The *scalp* is affected in association with pityriasis, etc. but pruritus capitis may be a pure neurosis and only respond to suggestion and sedatives.

Palmar and *plantar pruritus* are probably due to toxic irritation from some focal sepsis or from a gastro-intestinal source in the majority of cases.

The treatment of the cause is indicated in all these local forms of pruritus. If no cause is evident the general lines indicated above should be followed.

Prurigo

The name " prurigo " is applied to a group of itching papular eruptions. It is conveniently reserved for certain syndromes in which an idiopathic pruritus is the presenting feature. In the opinion of many authors, the pruritus is primary and the papules are produced as a special reaction of the skin to scratching By others the papules are looked upon as the essential feature, the itching being secondary Prurigo, like other itching affections, is often complicated by pyogenic infection and with eczematous conditions produced by scratching

Besnier s prurigo is the commonest variety The more grave affection, called after Hebra, is uncommon in this country and there are somewhat rare generalised and local conditions of milder type which require consideration in this place

Hebra s prurigo is exceedingly chronic. It begins in infancy or childhood and persists to adult life It is characterised by intense itching resulting in a widespread papular eruption and secondary changes in the skin produced by scratching

Etiology The cause is unknown. The disease has been seen associated

with asthma. Sensitisation to certain common articles of food and focal sepsis have been suggested as possible causes, but the patient's response to emotional stimuli is often more widely spread which points to psychological factors as the etiological basis. Due consideration must also be given to the endocrine balance for this determines the degree of chemical stimulation of the vegetative nervous system following emotional disturbances.



Fig. 70. Hebra's prurigo in a boy aged 18. The eruption had been present since infancy.

Pathology. The prurigo papule has at the onset an urticarial character, viz., œdema of the true skin with cellular infiltration about the vessel walls. The horny layer of the epidermis is thickened and split to form vesicles, the papillæ and upper layers of the cutis are infiltrated with cells, while the arrectores pilorum are thickened and contracted so that the hair follicles are in a state of erection. In the later stages the vesicles in the stratum corneum become pustules. The ultimate condition of the skin is chronic thickening of the prickle and corneous layers, with obliteration of many of the fine furrows of the surface, flattening of the papillæ and disappearance of the panniculus adiposus from compression. The whole integument is thus coarsened and toughened.

Clinical features. At the onset it is difficult to distinguish this affection from strophulus. It begins in the first year of life and at the age of three is characterised by intense itching, the child constantly scratching and producing innumerable excoriations of the punctate or linear type. Sometimes there are slight remissions in the severity of the symptoms, depending to some extent upon the seasons. The wrinkled and worried facies is characteristic and reflects the continual discomfort and anxiety of the sufferer.

In a characteristic case the skin has an earthy colour, the surface resembles goose flesh from the projection of the hair follicles, numbers of small pale or red papules are present, and as a rule large areas of excoriation, linear or punctate, with scabs or crusts. Localised or diffuse patches

of eczematous dermatitis and of pus infection are produced by constant scratching. In the advanced cases the whole integument feels thick and tough. The extensor surfaces of the limbs are the parts most affected the trunk is often involved, while the face is usually free. The lymphatic glands in the groins and axillæ are enlarged, and may suppurate (Fig. 76).

The children are irritable, nervous, and wasted, and insomnia from the itching is common. As a rule the disease prevents the child from attending school. At puberty or perhaps, as late as twenty-five, there is a tendency to spontaneous resolution, but in some cases the prurigo persists to adult life.

Asthma—Eczema—Prurigo Syndrome

Besnier's prurigo.—Besnier separated from the group of chronic eczemas a variety of prurigo which differs from that described by von Hebra. In Besnier's prurigo the eruption particularly *affects the flexures* of the knees and elbows, the face and the neck. Like the Hebra type the disease usually begins in infancy or childhood, and the subject is often highly strung and sensitive and may have a dry skin, xerodermia. It may be that the condition is the manifestation of an ectodermal defect, for like other defects it is inherited. The hypersensitive skin not only itches without obvious cause, but eczematous reactions are very readily induced and asthma is not uncommonly associated with the eruption or is present in one or other of the parents. Occasionally some offending allergen is discovered which provokes the most severe exacerbations, but often a number of exciting allergens are found and the patient's reaction to them varies from time to time. It is likely therefore that some basic hypersensitivity of the skin which is associated with similar hypersensitivity and reactivity of the nervous system is the primary basis for the condition.

With careful management some improvement may be expected to occur and there is often a change for the better at puberty but the tendency to relapsing prurigo of the flexures and to eczematous and papular responses in the skin is apt to persist throughout life and the condition is most prone to recur under emotional stress. The affected areas are diffusely lichenised, and attacks of weeping eczema with fissuring are common.

Under the name *prurigo ferox* Vidal described some fortunately rare cases, in which the lesions are larger and affect the face as well as the trunk and extremities. The itching is terrible.

Diagnosis. Hebra's prurigo has to be distinguished from other itching eruptions. It may be difficult at the onset to detect any difference between this affection and strophulus, but strophulus being an urticarial eruption is apt to vary new lesions appearing suddenly and symmetrically without preliminary scratching, and some of them fading just as quickly as they arrive. On the other hand, the papules of the prurigos are produced by scratching and although the primary response is an urticarial one repeated trauma to the skin surface induces thickening and hypertrophy which has an entirely different appearance from the urticarial papule on smooth skin. Lymphatic glands are often involved in prurigo because of the repeated damage to the skin surface with resultant degrees of

somewhat scaly but in a flexure it becomes macerated by the warmth and moisture The disease may last for several months to two years or more Recurrences are frequent and sometimes fresh plaques develop. The papular condition gradually disappears, leaving a brownish stain which may last for a long time but leucodermia is occasionally associated with localised prurigo There is no general pruritus, and no urticaria factitia.

The **diagnosis** is sometimes attended with difficulty The prurigos have to be distinguished from lichen planus and psoriasis from the seborrhoides, from chronic eczema and from some of the syphilides. The intense itching and the long duration are important features The papules of lichen planus are flat and shining their colour is peculiar and Wickham's striæ and points are present and there are often buccal lesions. However the circumscribed chronic hypertrophic plaques of lichen planus are sometimes indistinguishable from lichen simplex The seborrhoides are mainly in the middle line of the trunk and in the flexures In chronic eczema there is usually a history of previous vesication and in syphilis there are the general symptoms and absence of itching and the serological reactions upon which the differential diagnosis is based.

Treatment The treatment of the chronic localised prurigos is often unsatisfactory A simple plan is to cover the areas with an adhesive dressing of plaster such as the leucoplast of Unna, but in chronic cases the X rays in 50 r or Grenz rays (300 r) doses at intervals of three weeks best relieve the itching and promote resolution Occasional paintings with liquid phenol 80 per cent phenol in glycerin or with crude coal tar may give rapid and lasting relief but symptoms and the conditioned scratch reflex should be controlled by adequate sedatives and reassurance

Hutchinson's summer prurigo which appears to be dependent upon exposure to sun etc. and affects the face the backs of the hands, and other exposed parts, has elsewhere been considered (*vide* p 311)

Prurigo nodularis is a rare variety of prurigo characterised by a sparse eruption of discrete indurated papules and nodules situated chiefly on the extremities It usually occurs in women is intensely itching and very refractory to treatment Psychogenic factors appear to be most important in its etiology but we have seen the condition in a patient with thyrotoxicosis

CHAPTER IX

LICHEN PLANUS

LICHEN PLANUS is characterised by an eruption of small, lilac-tinted, flat-topped, shiny papules, polygonal in outline often showing a distribution peculiar to the disease and affecting mucous membranes.

Etiology The cause of lichen planus is unknown. The pathological appearances are compatible with a microbic or virus origin, but of this there is no positive evidence and contact cases are extremely rare, though we have seen suggestive cases. Barber in a personal communication reports the occurrence of lichen planus in a mother and newly-born babe. The extreme rarity of the disease in infancy makes this association the more significant of infective origin. The subjects are usually nervous and irritable, and there is frequently a history of some shock, worry or anxiety with insomnia, antecedent to the eruption. There has been a notable increase in the number of cases in civil practice during the last two great wars, doubtless due to protracted mental strain. These factors are sufficient to suggest a "nervous" origin, but, on the other hand, cases are met with in which there is no obvious "neurotic" element.

In support of the toxic hypothesis mention may be made of the occurrence of an eruption indistinguishable from lichen planus which occurs in about 1 to 2 per 1,000 persons taking mepacrine On the West Coast of Africa during the late war the following types were recognised a non weeping type exactly resembling lichen planus a similar condition associated with eczema; a lichen rash passing on to exfoliative dermatitis, and rarely pustular conditions. All types tend to become generalised but the extremities bear the heaviest brunt. Atrophy may follow an outbreak and when the scalp is involved alopecia may result. The buccal mucosa may be involved as in true lichen planus (*Lancet*, 1945 2, 711 Arsenic bismuth, gold and other drugs may cause a rash of similar type (p 161) Note that latent virus may be activated by drugs, *e.g.*, herpes or zoster Barber believes lichen planus is due to a virus.

Local irritation may determine an outbreak and scratching may increase the extent of the eruption. We have had several instances of familial cases.

The disease is most common between the ages of thirty and sixty Seventy two per cent. of 200 consecutive private patients were between these ages and 36 per cent. in the fourth decade. Women, at any rate in England, suffer more frequently than men females 60 per cent., males 40 per cent. Children are less often affected.

Pathology The pathological appearances are compatible as already mentioned with a microbic or virus origin, but no organism has been found The peculiar lilac tint is due to a combination of congestion, pigmentation and thickening of the epidermis. Both the epidermis and the true skin are involved. The stratum mucosum is hypertrophied, and in later lesions the horny layer is thickened. The stratum granulosum is increased, but the eleidine is irregularly thickened, and this causes the network of white striæ, which are pathognomonic of the eruption. At first the cells of the horny layer are not nucleated, but in older lesions the nuclei may be present. Horny plugs are found at the mouths of some of the follicles. The papillæ

are swollen often into a spheroidal shape and densely infiltrated with *mononuclear cells* *There is inter-cellular and intra-cellular oedema*, and vesication may occur The lower margin of the infiltration is remarkably distinct in sections.

Pigmentation is often marked and persists *after the inflammation has resolved* *Atrophy* of the epidermis and dermis may be a sequel.

Similar conditions are found in the mucous membrane lesions.

Clinical features. The elementary lesion is a smooth, flat topped papule of polygonal outline of a dull red to a violet or lilac colour varying *in size from a pin s head to a millet seed* or a little larger The surface of the papule has a burnished appearance reflecting light and this feature is a useful point in the differential diagnosis Some of the lesions have a slight *depression in the centre* indicating their origin around a duct or

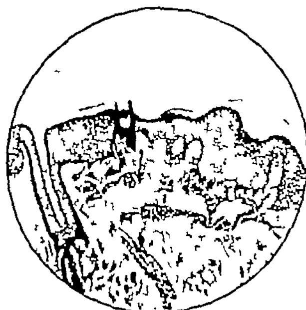


Fig 78 Lichen planus Microphotograph of section
Dr W J Oliver

follicle Under a lens, and particularly if the surface has been moistened with oil and water white opalescent points or striæ forming a fine net work are visible This sign first pointed out by Wickham is pathognomonic. Occasionally the papules are almost the colour of the normal skin

The papules may be discrete but usually by their aggregation form patches of rounded or irregular shape covered with fine adherent scales, which are made more obvious by *lightly scratching the surface* with the finger nail Careful examination will show that the large patches are composed of aggregations of small papules and even when the scaling is considerable, as in some of the thickened horny plaques below the knee it is usual to find typical shining flat topped papules at the margin of the scaly area, or in its vicinity *Patches of common lichen planus are never* formed by the peripheral extension of a papule, as in psoriasis, but in one rare form to be described later this method of extension may occur

PLATE 12



Lx Pla

Eruption of lilac-coloured, flat topped papules [on] the front of the forearm, showing on [illegible] examination the [illegible] of W[illegible]

are swollen often into a spheroidal shape and densely infiltrated with mononuclear cells There is inter-cellular and intra-cellular oedema and vesication may occur The lower margin of the infiltration is remarkably distinct in sections.

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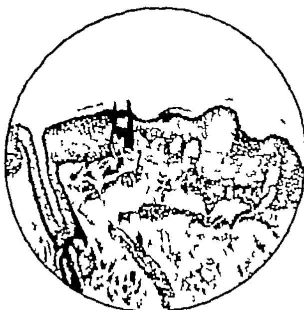


Fig 78 Lichen planus Microphotograph of section ↑ Dr W J Oliver

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PLATE 12



Lichen Planus

Eruption of lilac-coloured flat-topped papules on the front of the forearm showing on close examination the silvery striae of Wickham.

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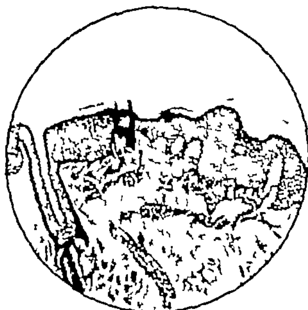


Fig 8 Lichen planus. Microphotograph of section
Dr W J Oliver

follicle Under a lens, and particularly if the surface has been moistened with oil and water white opalescent points or striæ forming a fine net work are visible This sign first pointed out by *Wickham* is pathognomonic. Occasionally the papules are almost the colour of the normal skin

The papules may be discrete but usually by their aggregation form patches of rounded or irregular shape covered with fine adherent scales, which are made more obvious by lightly scratching the surface with the finger nail. Careful examination will show that the large patches are composed of aggregations *of small papules, and* even when the scaling is considerable, as in some of the thickened horny plaques below the knee, it is usual to find typical shining flat topped papules at the margin of the scaly area, or in its vicinity Patches of common lichen planus are never formed by the peripheral extension of a papule as in psoriasis, but in one rare form, to be described later this method of extension may occur

PLATE 12



Lichen Planus

Eruption of lilac coloured flat topped papules on the front of the forearm showing one line [illegible] on the [illegible] side of [illegible].

are swollen often into a spheroidal shape and densely infiltrated with mononuclear cells There is inter-cellular and intra-cellular œdema and vesication may occur The lower margin of the infiltration is remarkably *distinct in sections.*

Pigmentation is often marked and persists after the inflammation has resolved Atrophy of the epidermis and dermis may be a sequel.

Similar conditions are found in the mucous membrane lesions.

Clinical features. The elementary lesion is a smooth, flat topped papule of polygonal outline of a dull red to a violet or lilac colour varying in size from a pin's head to a millet seed or a little larger The surface of the papule has a burnished appearance reflecting light and this feature is a useful point in the differential diagnosis Some of the lesions have a slight depression in the centre indicating their origin around a duct or

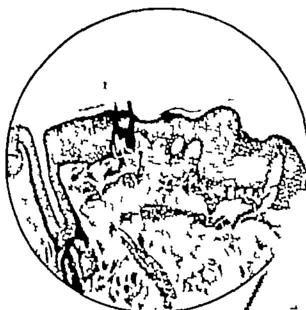


Fig 78 Lichen planus Microphotograph Dr W J Oliver

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PLATE 14



LICHEN PLANUS OF TONGUE AND BUCCAL MUCOSA



Lichen Plani

I at I f hl t t t m th l wer part t the leg and a few sc tt red papul al ve and below The colour i quit haract ristic

Very rarely a streak of lichen planus may run from the buttock to the inner side of the calf or to the heel, resembling a naevus unius lateris. Similar lesions may occur on the arm or elsewhere They are thought to follow Voigt's lines.

Zoster-like lesions. In rare instances the eruption is limited to the area supplied by one or more cutaneous nerves on the trunk or extremities. Barber has seen a zoster eruption replaced by lichen planus

Annular lesions Instead of forming plaques, the papules may form rings varying from a quarter of an inch to three-quarters of an inch in diameter The ringed lesions may be a prominent feature in the disease, but they are usually associated with the commoner discrete papules and patches. We have occasionally seen gyrate figures formed by broken rings. Ringed lesions are common on the penis and scrotum.

Lichen planus atrophicus is a variety in which the papules in the centre of a patch become cicatricial, while fresh papules form at the periphery until an area perhaps an inch or two in diameter is involved. The cicatricial area is pearly white, and sometimes minute horny plugs are seen at the mouths of the follicles.

Lichen sclerosus was thought by Hallopeau to be an atrophic variety of lichen planus but with others, we regard it as a separate entity It often more closely resembles morphœa than lichen planus, but the early lesions are firm, flat papules and the smooth ivory surface is sparsely pitted with brownish horny plugs in some of the follicles or with minute depressions when the plugs have fallen.

The disease is much more common in women than in men, and although it may affect the trunk, neck, axillæ or limbs it is sometimes limited to the vulva and anus (p. 662).

The cause is unknown and treatment unsatisfactory

Cicatricial patchy alopecia of the scalp associated with lichen planus elsewhere has been described by Graham Little.

Lichen planus obtusus The lesions are disseminated, brownish, or violet tinted swellings larger than a pea. They are not scaly and the itching is slight. They show massive cellular infiltration.

Lichen planus verrucosus, or Lichen hypertrophicus The lesions are warty elevations of deeper violet colour than the common type, and they are covered with masses of horny adherent scales. They vary in size from a quarter to one inch. They may be discrete or occur in groups. Itching is variable and usually worse at night. The legs are most affected, but the thighs, elbows, and trunk may be involved (Fig 80).

Lichen planus from drugs An extraordinary hypertrophic lichen planus extensively involving trunk, limbs, head and face and mucous membranes may occur as the result of idiosyncrasy to the drug mepacrine used in the treatment of malaria. All the hair may fall with the eruption.

Injections of gold salts, of organic arsenicals and of bismuth provoke on occasion, widespread eruptions indistinguishable from ordinary lichen planus. They are generally severe often involve the face and head as well a trunk and limbs. They tend to leave very intense black pigmentation of the skin which persists for a long period.

Lichen nitidus (Lat. shining). Under this name Pinkus described a papular eruption characterised by numerous sharply-defined, flat-topped,

aspect of the cheeks, opposite the teeth, is the favourite site of the eruption; less frequently the tongue and palate are involved, and the red margin of the lips is occasionally studded with small white papules. The lesions are white porcelain-like patches of irregular shape, or a network of fine white striæ, or white or yellowish discrete papules the size of a pin's head. Similar lesions occur on the labia and on the glans penis, but in the latter situation the papules may be the same colour as the mucous membrane. In rare cases the lesions may be confined to the buccal mucosa, the glans penis or vulva.

Itching is usually a predominant feature in lichen planus, but occasionally it is slight and intermittent. In some cases it is distressing to the patient, preventing sleep and causing frantic scratching. It is usually worst at the beginning of the attack, but it may persist in chronic patches. The buccal lesions rarely trouble the patient. Diarrhœa occasionally occurs, and it has been suggested that this is due to an eruption of papules in the alimentary canal. One of us (J. T. I.) has twice seen the lesions on the rectal mucosa on sigmoidoscope examination. The general symptoms depend upon the acuteness of the attack and on the severity and duration of the itching.

Occasionally in severe cases there is considerable enlargement of the lymphatic glands.

Course. Lichen planus may run an acute or a chronic course. The chronic cases are by far the more common. The disease begins insidiously and progresses slowly, the eruption gradually spreading for several months, and then remaining stationary, but commonly there are subacute exacerbations, in which fresh lesions appear and new areas are attacked. Occasionally the disease persists for years. Resolution takes place slowly, the upper extremities clearing before the lower, but the spots affected may remain pigmented for months.

In the acute form large areas of the trunk and limbs are rapidly involved. In the severest type the skin may be diffusely red and swollen, and small papules appear in large numbers on the affected areas. There are intense itching and fever and other systemic disturbances. The acute cases tend to clear up more rapidly than those of gradual onset, perhaps in a month or two, but sometimes they pass into the chronic type.

Variations. *Acuminate lesions* sometimes occur with the plane papules (L. plano pilaris). They are elevations with a central follicular plug, and run together to form nutmeg-grater-like patches. The papules on the neck may have horny spines.

Vesicles and bullæ occasionally occur in association with the characteristic papules. As a rule they are transitory and of little importance.

Linear lesions. Associated with the discrete papules and patches, it is not unusual to see streaks formed of a line of closely set papules. These commonly occur on the limbs in the line of a scratch during the eruptive phase.

Spillmann and his colleagues (*Bulletin de la Soc. franç. de Derm.*, 1930, p. 1005) present a beautiful illustration of lichen planus in the circles produced by the cupping glass applied to the back for bronchitis. The patient, a male aged twenty-four, had typical lichen planus in the usual sites and on the buccal mucosa.

and not flat and they usually occur in groups on the trunk They do not itch, and there are no mucous membrane lesions.

In parapsoriasis the lesions are not shining, and the striæ of Wickham are absent, and the mucous membranes are not affected

Lichen amyloidosis resembles hypertrophic lichen planus (p 101)

The atrophic lesions of lichen planus may be mistaken for idiopathic macular atrophy or scleroderma guttata (Fig 91 p. 188). On the scalp they may simulate lupus erythematosus and pseudo-pelade (Fig 375 p. 718), and cicatricial alopecia of syphilitic or septic origin.

Prognosis. In the acute cases involving large areas, the course is generally more rapid than in the common type The majority of cases however run a chronic course and may persist for months, sometimes even for years Recurrences after long intervals occasionally occur We have notes of several cases in which four or five years have elapsed between the attacks.

Treatment. Diet appears to have no influence upon the disease, but large doses of aneurin are thought to be of value.

The patient is best at rest in bed and away from business and worry A change of environment and a holiday are of great value in treatment.

Warm sedative baths are comforting, and relieve the irritation. Alkaline baths are also useful, a teaspoonful of sodii bicarb being added to each gallon of water Chronic patches yield to small doses of the X rays.

Pautrier claims to have cured lichen planus by applying X-rays to the spinal cord, without any local treatment.

Hellier has shown that the treatment may be applied to skin elsewhere on the body—other than over the spinal cord—with equally good results. The effects are probably psychological.

In the early stages salicin in fifteen- to twenty-grain doses three times a day appears to lessen the inflammation and to diminish itching Antipyrin is also useful given in full doses at night when the irritation is severe It should be steadily pushed as far as the tolerance of the patient will allow Mercury in the form of the biniodide is also of great service.

Good results often follow injections of gr ½ to gr 1 of Enesol (mercuric salicyl-arsonate –Martindale) intramuscular or intravenous at weekly intervals to a total of 6 to 8 grains.

Ingram has on three occasions seen intestinal hæmorrhage causing intussusception from intravenous use of the drug without other signs of intolerance—the courses of treatment were subsequently completed.

Lotions, ointments, and pastes containing tar and carbolic acid are most useful to relieve irritation. The following formulæ may be used —

℞ Liquor plumbi, ♏60
Liquor carbonis detergens, ♏120
Aquam. ad oz. 1

Liquefied phenol ten to fifteen minims to the ounce, in lotion or ointment –

℞ Hydrarg perchlor gr 2
Glycerin. ♏10
A carbol., gr 20
Ol. Olivæ ♏40
Ung zinci, ad oz. 1

shiny pinhead sized papules without any tendency to grouping or confluence and practically the same colour as the normal skin. It is commonest on the genitals, the abdomen, breast and about the anus. Arndt collected thirteen cases all in males between the ages of twelve and forty five. The lesions consist of epithelioid cells with giant-cells directly under the epidermis, and bounded laterally by a prolonged epithelial process. The cells are mono- and poly nuclear leucocytes.

The small size of the lesions and the absence of the lilac tint distinguish L. nitidus from the usual type of L. planus.

Diagnosis Mistaken diagnoses are not infrequent in lichen planus. Perhaps the commonest eruption leading to error is lichen simplex. This is an irritating dermatosis which in some sites, *e g* the sides of the neck may closely simulate lichen planus. It usually has a dull brownish red



Fig 80 Hypertrophic lichen planus.

surface with aggregation of papules due to exaggeration of the skin pattern. Discrete papules are rare and the mucosæ not affected.

Secondary syphilis is not infrequently diagnosed especially in those cases of lichen planus attended with pigmentation. The peculiar lilac colour of the papules and their burnished character and white striæ and points on the surface of the lesions should be sufficiently distinctive to prevent this mistake. Moreover the lichen planus eruption is all of one type and the mucous membrane lesions are quite different from those of lues. General enlargement of the lymphatic glands is rare and there is usually intense itching. A serological test will remove doubt.

The papules of *strophulus* are usually rounded, smooth pale and shotty and should not be mistaken for lichen planus which is not common in infancy.

In prurigo nodularis the individual lesions are rounded and not flat and there are no white striæ (p 176)

Lichen scrofulosorum occurs in strumous patients, and there is usually some obvious tuberculous disease. The papules are acuminate or rounded

and not flat, and they usually occur in groups on the trunk. They do not itch, and there are no mucous membrane lesions.

In parapsoriasis the lesions are not shining and the striæ of Wickham are absent and the mucous membranes are not affected

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Glycerin, ♏10
Ac carbol., gr 20
Ol. Olivæ ♏40;
Ung zinci ad oz. 1

Lichen convex. Under this name Castellani described a common disease in the natives of Ceylon characterised by numerous smooth convex pink or red follicular papules about $\frac{1}{16}$ to $\frac{1}{8}$ inch in diameter The chest, back and shoulders are most affected The eruption itches intensely and lasts for several months and tends to recur Antipruritic lotions are used

Dermatitis nodosa tropica occurs on the face and trunk. The lesions are hemispherical angry red hard non-scaly nodules as large as a pea There is intense itching but no urticaria The lymphatic glands and the parotid are enlarged and there is eosinophilia The disease may last for six months to a year or more The lesions leave no scar Drugs have no influence on the condition Antipruritic lotions are used to relieve the itching

Lichen Axillaris (Fox Fordyce Disease)

This rare affection is characterised by small circular dome-shaped itching papules affecting the hairy parts of the axillæ and pubes and is of endocrine origin (p 100)

CHAPTER X

ALOPECIA LEUCODERMIA SCLERODERMIA AND DERMATOMYOSITIS

These conditions are grouped together because the first two are not uncommonly associated and occasionally it is difficult to decide whether a white area of skin is leucodermia or morphoea. White hair leucotrichia, is seen in early and in resolving alopecia and is constant in leucodermic lesions on the scalp. Leuconychia may also occur in either of these two diseases and in severe cases of alopecia the nails may be shed.

Alopecia Areata

(Gk. *alopekia*, fox mange)

Etiology Alopecia areata is the result of disturbance of function in the skin, usually the scalp, which is followed by falling of hair This disturbance of function is consequent upon some shock to the constitution



Fig. 81 Alopecia areata (common type).

which may be nervous or emotional, toxic or traumatic and may occur with endocrine change or disturbance as at puberty menopause, pregnancy etc. Certain individuals are particularly prone to this pattern of reaction and may experience repeated attacks through life from a variety of causes.

Not uncommonly the tendency to react in this fashion is a familial one though it is very uncommon to see two members of a family affected at the



Fig. 82. Leucotrichia following alopecia areata. The hair ultimately regained its normal colour.



Fig. 83. Alopecia areata (ophiasic type).

same time. There is no evidence to support the idea that alopecia areata is dependent upon any parasitic or any other infection.

Pathology. The follicles are atrophic and there is often a small degree of cellular infiltration about the papillæ. The hairs at the periphery of a

patch tend to be dystrophic showing withering of the root, with a white tapering of the hair towards the root, while the remainder of the hair is apparently normal and by contrast appears swollen and darker than normal, giving rise to the characteristic "note of exclamation" hair. It is brittle and tends to break off at a variable distance from the scalp. The sebaceous glands are also atrophic.

Clinical features. *Common type.* The onset is insidious, the patient or a parent noticing that an area of the scalp has become bald. The patches are usually round or oval, often multiple, and they gradually spread, and sometimes, by extension and coalescence, may involve the



FIG. 84. Hairs of alopecia areata magnified.

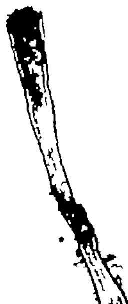


FIG. 85. Alopecia areata. Clubbed hair.

whole scalp. The areas are smooth, or perhaps, covered with downy hair. Round the margins the hairs are frequently atrophic at their proximal ends, and of the usual diameter at the periphery so that they resemble the note of exclamation (!). This appearance was once considered pathognomic of alopecia areata, but it is sometimes seen after the application of the X-rays. Occasionally the skin of the bald patch is thinned and easily wrinkled. In the stage of recovery the patches are covered with downy pale hairs, which subsequently become strong but are often white for a time. In most cases however complete recovery of the strength and colour occurs (Fig. 8).

Any part of the scalp may be affected, and also the beard and moustache regions and the eyebrows. Occasionally the patches are remarkably symmetrical. In rare instances the bald area corresponds to that supplied by a cutaneous nerve. In the *ophiasic* (serpentine) variety the bald area runs round the margin of the hairy scalp (Fig. 85).

In some cases the areate patches fuse and eventually the whole of the scalp becomes bald **alopecia totalis** The eyebrows and eyelashes are commonly affected also (Fig 80)

Leuconychia may occur in connection with alopecia areata and rarely the nails are shed

Universal alopecia in which not only the hair of the head, eyebrows, eyelashes and beard region is lost but also that of the axillary pubic and other regions, is comparatively rare We have seen it associated with extensive vitiligo It commonly begins like an alopecia areata and spreads rapidly It may occur in Lorain's type of infantilism (p. 104).

Alopecia areata sometimes affects areas on the shins

Diagnosis Alopecia areata has to be distinguished from cicatricial alopecia in which atrophy is usually manifest by smooth, thin skin, with



Fig 80 Alopecia totalis.

absence of follicular orifices. It has also to be diagnosed from some forms of ringworm Here the examination of hairs from the margin of the patch for fungus will usually be sufficient Pseudo-pelade will be considered in the next section

Prognosis *In young subjects recovery usually takes place after perhaps, several months* In the ophiasic form the prospects are not so good In older subjects the hair may never return Recurrences are not uncommon.

As a rule alopecia areata of any extent and lasting more than a few months, or occurring at puberty or at the menopause is likely to be severe and persistent Similarly if there is a strong family history or a strong past history of alopecia areata or if the condition arises for no very apparent cause the prognosis is not good

Treatment Most cases of alopecia areata are a transient reaction to

some minor constitutional disturbance and cure occurs spontaneously in the course of two to four months. Treatment in such cases makes little difference to the course of the affection. Where the trouble is more persistent, however attention must be paid to the general health, towards the elimination of any foci of sepsis, the correction of anaemias dyspepsias, nervous debilities, etc. and any emotional stresses and strains must if possible be resolved. Simple mild sedative-tonic measures internally will usually help the patient, such measures as phenobarbitone gr ½ once or twice a day mist. pot. brom. co. or vitamin B therapy Stimulating drugs, thyroid, etc., should be avoided. General ultra violet light therapy to the whole body is a valuable tonic measure in this regard, and a change of environment and a holiday should be advised.

These general measures constitute the most essential part of treatment and local measures are merely attempts to restore the hair follicles to functional activity by improving the blood supply They can have little effect upon the vegetative nervous system or the endocrine glands which are the real dictators of follicular activity

Friction and massage of the parts are advocated, but the application of lotions and paints containing rubefacients appear to be more valuable. An essential oil—*e.g.*, oil of nutmeg 1 part, olive oil 8 parts—daily rubbed in is a useful application. Cantharides in varying strengths is most valuable, either in a lotion or the following solution cantharides solution 1 drachm, acetic acid 1 drachm, spirit 1 ounce. It is painted on lightly and allowed to dry Should there be blistering the treatment is intermitted. Ammonia, turpentine, acetic acid are also used. (For formulæ, *vide* p. 749). Treatment with high frequency diathermy ionisation, Faradism and local U.V.L. have been sometimes attended with success, but we are not convinced that they are of greater value than any other means of stimulating the circulation in the skin. This also applies to Thorium X (p. 770).

LEUCODERMIA, MELANODERMIA AND CHLOASMA

(Gk. *chloazo* become green)

The congenital pigmentary anomalies, albinism and pigmented moles and in neuro-fibromatosis have been discussed in Chapter III., and the effects of sunlight, heat and X rays in Chapter XVI. We have noticed that various inflammatory conditions of the skin leave stains, and that some drugs notably arsenic and silver discolour the skin. Attention is drawn to the pigmentary syphilide (p. 539) and to the changes in leprosy (p 507) and pinta (p 563). The dyschromias associated with general and visceral disease hæmochromatosis, ochronosis, jaundice and pigmentation in Addison and Graves diseases hyperpituitarism, chronic intestinal stasis etc have been considered in Chapter IV We have already dealt with the peculiar pigmentary affection known as chloasma (p 103) The cause is endocrine and the condition occurs in pregnancy and in association with uterine and ovarian disease In the chapter on Tumours of the Skin we shall consider the melanotic carcinomata which usually develop from pigmented moles.

Leucodermia Vitiligo

(Gk *leukos* white) (Lat *vitium* a blemish)

The term leucodermia may be descriptively applied to any area of white skin and this may occur as a congenital anomaly or secondary to inflammatory lesions such as the leucodermic macules of syphilis or similar macules that occasionally mark the resolved lesions of lichen *planus, psoriasis parapsoriasis*, pityriasis rosea eczema and prurigo It is to the idiopathic variety of primary leucodermia that the name *vitiligo* is given This condition is characterised by the absence of pigment in certain areas, and also by the inability of the melanoblasts in the pale areas to form pigment This is manifest by the negative dopa reaction and a failure to react normally to ultraviolet light It is usually associated with hyperpigmentation around the white spots.

While true leucodermia is to be regarded as a functional disturbance of the pigment mechanism similar patches of leucodermia, sometimes affecting the hair leucotrichia may occur as a congenital abnormality Here the condition is undoubtedly a developmental defect of the skin and the affected areas are sharply defined and persist throughout life

Etiology *The affection is more common in adolescence and youth than* in mature age Females are more frequently affected than males and the disease is commoner among the dark races than in fair people The cause of leucodermia is unknown but it has supervened upon shock and has been observed in connection with Graves disease and with tabes. Tourame *and Brizard have collected 33 cases of vitiligo in which the distribution of* the white patches has corresponded with one or more nerve-root areas. Blaschko (as far back as 1001) Jadassohn and others have confirmed the observation It is suggested that vitiligo is a neuro-dermatosis. Sequeira saw a man who while employed on a lightship in the Channel during the war of 1914 18 developed alopecia universalis with extensive *vitiligo* of the trunk and extremities Occasionally leucodermia has occurred in connection with alopecia areata lichen planus, prurigo and scleroderma. Cases are also recorded in which urticarial wheals could be easily produced (dermographism)

In some cases an erythematous reaction has been noted at the *spreading* margin of the white areas. This is unusual and the significance of the hyperæmia is not understood The function of pigmentation is a very complex one and depends upon the activity of the special pigment forming cells *melanoblasts* and also upon the action of enzymes on pro pigment. Although it is well known that pigmentation is influenced by suprarenal and ovarian functions we have no evidence that vitiligo is the result of any *specific* endocrine disturbance

Pathology There is a complete absence of melanin and a negative dopa reaction with increase of pigmentation in the surrounding areas. Some observers have noticed inflammatory infiltrates of *small round cells* about the vessels and glandular elements, and it is a question whether *this* is a reaction to some toxin or of the unguarded skin to ultraviolet light. Mild degrees of atrophy may be present, but are only observable through the microscope

Clinical features. *The white spots are generally rounded at the onset,*

and the margins are well defined. The colour is milky or like ivory. The spots are often limited, but they may extend over the greater part of the body. Schamberg pictures a negro who in seven years lost all the pigment of the skin except on small areas on the face and scrotum.

The increase of pigment is most marked around the white areas, and gradually shades away to the normal colour. The hair on the white



Fig. 67. Leucodermia. Vitiligo.

patches is usually devoid of colour—leucotrichia. There are no symptoms, and the glandular functions are quite normal and the white areas are not visibly atrophic.

Any part of the body may be affected, but the commonest sites are the hands, forearms, the face and neck, and the lower part of the abdomen, thighs, and genital regions. The mucous surfaces are not involved.

Leucodermia may begin acutely but its evolution is usually slow

From time to time there may be variations, and the increase of pigment in the summer often makes the white patches more conspicuous, but as a rule the progress is one of gradual extension which by the coalescence of adjoining areas may involve large tracts.

The white areas cannot be made to pigment by light, but an actinic dermatitis is very readily produced on them although reaction to other irritants is variable. Lupus erythematosus may arise on leucodermic areas.

The **diagnosis** is usually easy but the discoloration may cause the affection to be mistaken for tinea versicolor and for some of the conditions in which *melanosis is a feature*. *The areas of pityriasis versicolor are of a café au lait* tint and slightly scaly. The scales may be scraped off and the fungus demonstrated by examination under the microscope in a little liquor potassa.

Syphilitic leucodermia is confined to the neck and occurs in women. It has a peculiar dappled appearance (*vide* p. 580). Arsenical pigmentation is also dappled but it affects the covered parts, the abdomen and chest. The pigmentation of Addison's disease, etc. is not associated with white areas, and the buccal mucosa is affected. Sclerodermia might give rise to difficulty but is excluded by the toughness of the affected patches which is completely absent in leucodermia. In the white patches of lepra there is anæsthesia and the nerves are thickened. The atrophic patches of radio-dermatitis are covered with telangiectases.

Prognosis. The disease is very little influenced by treatment. It may rarely resolve or depigmentation may become universal.

Treatment. Since the etiology is obscure and no constant findings of endocrine dysfunction have been observed, no specific remedy of the disease is known. The simplest procedure is to tint the pale areas with walnut juice or permanganate of potash and this protective coloration will relieve the exhausted pigment cells from the light stimulus. Oil of bergamot or some common impurity of it which may be a copper salt often produces increased pigmentation of the skin and accounts for Berlocke dermatitis (see page 811), so that a 10 per cent solution of this oil in spirit has been applied to white areas of skin which are then exposed to ultraviolet light in an attempt to stimulate pigment formation. Injections of gold salts have been combined with this local therapy because gold is known to sensitise the skin to sunlight. Recently good results have been claimed for intensive vitamin B therapy combined with full doses of dilute hydrochloric acid with meals.

Sclerodermia

(Gk. *skleros*, hard)

The name Sclerodermia is applied to a group of affections of unknown origin in which the skin and subcutaneous tissue become thick and tough and ultimately atrophic.

Sclerema neonatorum erroneously regarded as one type of sclerodermia has been described already (p. 102).

Etiology of sclerodermia. The cause of sclerodermia is unknown. A survey of the literature shows that this cutaneous affection occurs in con

nection with such a variety of conditions that it is difficult to believe that many of the causal relationships which have been suggested can be accepted. No micro-organisms have been demonstrated in the cases examined, but it is worthy of note that the disease has been seen as a sequel to scarlatina, diphtheria, erysipelas, infectious tonsillitis, pneumonia, tuberculosis, influenza, malaria, measles and other febrile illnesses.

Sellei believes that true sclerodermia is a trophic disturbance due to some lack of intestinal ferments and states that a pancreatic dysfunction is indicated by a positive atoxyl lipase resistance test.

Another hypothesis is that sclerodermia is a tropho- or angiotrophoneurosis, caused by changes in the nervous system. The peculiar distribution seen in some cases of morphoeic sclerodermia supports this contention. It is more difficult to accept this hypothesis in cases of diffuse sclerodermia, which may possibly have a different cause.

Yet another hypothesis is that sclerodermia is the result of extensive endarteritis. In this connection it is interesting to note its occasional co-existence with Raynaud's disease.

Regarding the influence of internal secretions in the causation of sclerodermia, thyroid atrophy is the commonest glandular defect, but Graves' disease, Addison's disease and acromegaly have all been seen in association with the cutaneous affection. In a woman under Sequeira's care sclerodermia of both legs developed after she had been taking thyroid extract for myxœdema for sixteen years.

Pathology. Vascular dilatation, proliferations of connective tissue cells and collagen are followed by endarteritis, obliteration and absorption of the vessels and a diffuse sclerosis over which the epithelium is thinned. Elastic tissue is not much affected, glandular elements disappear and the horny layer of the epidermis may later be increased.

Generalised Sclerodermia

This condition is rare. In exceptional cases it may develop acutely. The patient first notices stiffness in the movement of the limbs and of the trunk, and his breathing becomes difficult. The malady progresses rapidly and may be fatal in a few weeks to several months. The skin is thickened and indurated, and these changes spread widely. In some cases the underlying muscles are involved when the condition may be termed sclerodermatomyositis.

The chronic form is less rare and the indurative process may be superficial or involve the subcutis in which calcinosis may develop. It is preceded by wasting pains in the joints and neuralgia, and from time to time there are febrile symptoms. Sometimes there are areas of local asphyxia (Raynaud's phenomena) or erythematous patches, with burning and itching. In other cases there is œdema or local swelling. This stage is followed by the peculiar induration and thickening of the skin, which may affect the whole integument, or large diffuse areas. On palpation the affected parts are found to be in a condition of solid œdema, they do not pit on pressure, and there is attachment to the deep structures. A remarkable immobility is thus produced. The expressionless face looks as if carved in marble and speaking and taking food are exceedingly difficult. The stiffness of the neck and chest impede respiration, and some-

times swallowing is difficult The proximal parts of the limbs are affected in greater or less degree but the movements of the fingers are less impaired. The skin has a peculiar yellowish brown tint with greyish or pink spots In the third stage a gradual atrophy supervenes, perhaps after a lapse of some months The integument becomes fibrotic, the subcutaneous tissue is absorbed the muscles themselves may become tough and fibrous. The skin is firmly attached both to them and to the bones.



FIG 83 Sclerodermia (showing contracture of indurated wax like skin).

The unyielding envelope thus formed is the cause of the greatest distress to the patients. There is a constant sensation of cold, but the cutaneous sensibility is unaffected Atrophy of the thyroid and also Graves disease are occasionally present but their relationship to the sclerodermia is not understood Death usually occurs from some intercurrent disease, especially pneumonia, but also from the gradual loss of strength Recovery may take place if the atrophic stage has not been reached

Sclerodermia of the Extremities

In this group two types of probably different causation have been included —

(1) *Acrosclerosis* (Sellei) This is probably secondary to vaso-motor dysfunction with acrocyanosis and acro-asphyxia as initial symptoms.

(2) *Sclerodactylia.* Usually an extension of ordinary sclerodermia.

(1) Acrosclerosis begins at the periphery and slowly progresses. The onset is rather like that of Raynaud's disease, with darting neuralgic pains or a feeling of cold, associated with "dead" fingers (acro-asphyxia) or blueness of the extremities (acrocyanosis). Occasionally there is excessive sweating and sometimes blebs form. As a rule, the affection begins on the fingers, but it may start on the auricles or on the nose.

The intensity of the symptoms varies greatly from time to time but after the lapse of several months, or perhaps years, the fingers gradually waste, the skin atrophies and is attached to the bones. The digits cannot be extended or flexed, and the skin, which is firmly bound to the bones, is greyish or dull in tint. The process of mummification begins at the terminal phalanges, and gradually spreads up the fingers to the forearms. The gradual atrophy from the periphery produces a tapering digit like an elongated radish. The subcutaneous tissue and the tendons are involved.



Fig. [illegible]. Sclerodactyly (Gk. skleros, hard, daktulos, finger).

Callous ulceration or necrosis with absorption of the bones leads to spontaneous amputation very similar to that observed in nerve leprosy. The nails are atrophic or claw-like. The process described as occurring in the fingers occurs to a less degree in the toes.

In acrosclerosis the process starts at the extremity of the digits and spreads to the hand or foot and the face presents a lack of expression but no thickening of the tissues.

In sclerodermia the process starts about the wrists and spreads towards the digit and facial changes are associated with sclerosis.

In acrosclerosis no other parts than hands, feet and face are affected. the affection is not progressive beyond a certain state—though secondary local changes, necrosis, etc., from interference with nutrition may continue.

Treatment is without effect. Prognosis, except as regards the local condition is good.

(2) Sclerodactylia. In a characteristic case the extremities and the face are affected. The features are fixed like those of a mask or statue,

the skin being a peculiar pale pink tint The eyelids are closed with difficulty As the condition advances the movements of mastication and deglutition become impaired The hands and fingers are flexed (Fig 89) and movements are much restricted The hand muscles are wasted and the skin over them and the lower part of the forearms is pigmented The feet and legs are similarly but less involved

There remains one point to be mentioned and that is *pigmentation* This is always present but it may not be confined to the sclerosed areas of skin

Progressive sclerodermia always runs a very slow course and death usually takes place from intercurrent disease Sudden death without apparent cause is however not unknown

Diagnosis At the onset it may be very difficult to determine whether the condition is Raynaud's disease or sclerodermia Leprosy is distinguished by the anaesthesia and thickening of the nerves.

Syringomyelia is attended with peculiar alterations in the sensibility and by the absence of induration of the skin The pigmentary changes of sclerodermia must be borne in mind in the differential diagnosis of melanodermia

REFERENCE —J SELLEI 1934 *Brit Journ Derm and Syph* 46, 523.

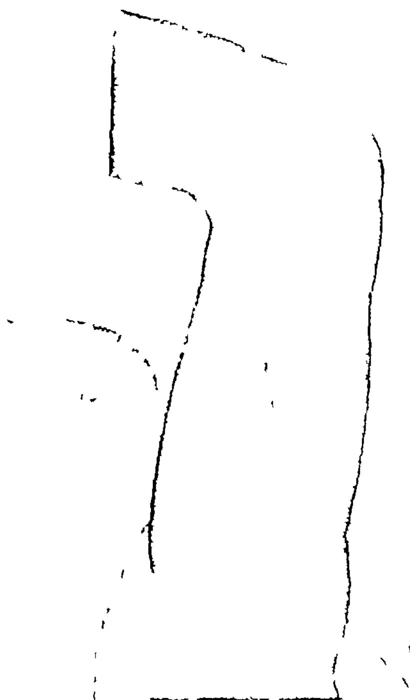
Localised Sclerodermia Morphœa (Gk. *morphe* form)

This variety of sclerodermia differs from the previously described forms in being limited to plaques or bands The disease is much commoner in females than in males The plaques appear without any previous symptoms as thickened indurated pink or mauve coloured patches, which gradually extend. After a few weeks, or perhaps several months, the central part of the plaque becomes pale and often assumes the colour of old ivory As a rule the surface of the white area is smooth but occasionally it may be nodular The patches are oval or irregular and the characteristic mauve zone about the pale central patch produces a very characteristic clinical picture Occasionally there are minute telangiectases on the area and rarely scaling The plaque is tough unpinchable and attached to the deeper structures There is no hair on it and sweating is absent In most cases the plaques gradually extend to a certain limit and then remain stationary Some patients complain of itching or pricking but this is usually in the early stages only When the part is sclerosed there is generally some degree of anaesthesia The ultimate condition in most cases is a depressed atrophic area, though the condition may clear without leaving any change in the skin

The lesions of morphœa may appear on any part of the trunk or limbs and sometimes have a segmental distribution The vulva and anus may be affected and the lesions often irritate and may be mistaken for lichen sclerosus or leucoplakia Morphœa is not uncommon on the breasts or in the axillæ

The band like form of morphœa is remarkable It has similar characters to the plaque variety but is often a deeper process and may involve underlying muscles. The raised bands may show patchy hyperkeratosis which produces dull rough patches upon the waxy surface so peculiar to

PLATE 15



[illegible] MODIGLIANI

Interesting [illegible] form of young woman. Not very like centre and like edge

morphœa and scleroderma. There is the same zone of mauve or purplish erythema with a central pale area, which in time comes to resemble old ivory (Plate 15). The bands extend the length of the limbs, or around the trunk or around a digit. In one of our cases following an injury a band extended from the level of the left great trochanter across the thigh along the line of the sartorius muscle to the inner side of the knee. The band here was about an inch and a half wide. Below the knee it widened out to take in the anterior and inner surfaces of the leg ending on the foot just above the roots of the toes. Associated with this were patches of sclerosis and atrophy affecting the left half of the abdomen. The latter spots had the distribution of the anterior parts of cutaneous nerves, but the lateral and posterior parts were unaffected The lesions of the trunk were on the



Fig. 90. Fronto-nasal morphœa.

same side as the band on the limb. This case illustrated another feature of morphœa the intractable character of the ulcerations produced by slight traumatism. A slight blow on the shin was followed by ulceration, which took many months to heal, and rapidly broke down on the patient leaving hospital. An interesting form is illustrated in Fig 90 Here the scleroderma affected the fronto-nasal area, causing a depressed scar-like lesion extending from the root of the nose on to the forehead to one side of the middle line There was a groove in the frontal bone corresponding to the sclerosed area of skin. This " blaze " type of lesion may have a central origin. The band form of scleroderma may be associated with anterior poliomyelitis.

The bands which occasionally form round the fingers or round the arm lead to œdema and swelling and may even cause necrotic changes similar to those observed in ainhum (p. 601).

The diagnosis of the band form of morphœa should not present much difficulty. There is nothing like the sclerosed tracts running along a limb. The local rounded patches are diagnosed by their toughness, by the impossibility of pinching them up from the deeper tissues, and the mauve margin to the pale areas. Cancer en cuirasse is usually described as being likely to be mistaken, but it is generally secondary to a mammary tumour and only the rare apparently primary cases could be mistaken, and in them there are pain, involvement of the glands, and œdema of the arm.

Progressive hemiatrophy of the face, involving bone, muscle and skin, sometimes occurs in relation with morphœa.

Sclerodermia guttata. White Spot Disease

(Lat. *gutta*, a drop)

This somewhat rare condition has received much attention in recent literature. The characteristic features are the development of a number of small pearly white indurated lesions. In the characteristic case illustrated in Fig. 91 the groups of spots were on the right side of the abdomen and on the left leg. Surrounding the groups of spots was a



Fig. 91. Sclerodermia guttata.

number of very fine telangiectases. The patient was a woman aged fifty-five, and the history was that the eruption appeared as irritable papules which died away leaving white spots. The white spots may extend round the base of the neck like a necklace. In one of our cases the band form of sclerodermia was associated with lesions of the guttate type. Guttate sclerodermia must be differentiated from atrophic lichen planus, and here the history will be of service. Characteristic lichen papules may be present in some other part of the body, and there is usually severe irritation, specially in the early stages of lichen planus. The white papules

of lichen sclerosus may present more difficulty but their surfaces often show follicular plugs or pits unlike the smooth pearly white lesions of morphœa guttata.

Treatment of Scleroderma. In all cases the patient should be warmly clad, as relapses frequently follow chills and exposure. In view of the occasional association of Graves' disease and atrophy of the thyroid gland, thyroid treatment has been tried, but without much success. Hypophysin and pituitrin are reported as being of benefit. No specific remedy is known, but one of us, J. T. I., has had some success with gold therapy in the treatment of morphœa and vitamin A appears to be of service. Local treatment is of little value but small doses of X rays (150 r) and massage with a cod-liver oil ointment may be tried.

Dermatomyositis. The earliest symptoms of this disease are erythema and swelling of the eyelids, face and parts of the limbs. An intermittent fever is usual in this stage. Muscular weakness is noticed early or within a year of the cutaneous symptoms. Later the affected muscles become indurated and atrophic and contractures are apt to develop. The skin becomes harsh and scaly with varying degrees of induration and later pigmentary and vascular changes, as seen in poikilodermia, may develop (Fig. 130).

These conditions were described together in a case by Petges and Cléjat in 1906 and after studying further cases, in 1929 Petges changed the name of the condition to "poikilo-dermatomyositis." Although the conditions do occur together Dowling and Freudenthal (1938) reviewed the evidence, and concluded that they were two entirely separate diseases. They are included here because a hardening of the skin, imitating scleroderma, is sometimes a well marked feature of dermatomyositis (see Poikilodermia, p. 273). The sclerodermatous changes may be prominent and produce a clinical picture indistinguishable from sclerodactylia.

The etiology of both conditions, like that of scleroderma, remains obscure but it has been suggested that thyroid dysfunction is responsible for dermatomyositis.

Histology. The epidermis is thinned and sometimes hyperkeratotic, the rete pegs are greatly diminished and often entirely absent. There is no infiltration of the dermis, but the collagen bundles are thickened and matted together which accounts for the sclerosis. The connective-tissue cells are usually decreased. The elastic fibres are diminished or absent. In the early stages the muscle fibres are oedematous and show infiltration with histiocytes, plasma cells and lymphocytes with focal collections of central lymphocytes and peripheral plasma cells forming lymphorrhages. Later the muscle fibres show varying degrees of degeneration with marked proliferation of the sarcolemma cells, some of which invade the muscle fibres.

Reference. J. T. Ingram and H. J. Stewart. 1934. *Brit. Journ. Derm. and Syph.*, 46, 22.

Nodular panniculitis. This is a chronic inflammatory affection of the subcutaneous fat which may produce a picture resembling dermatomyositis.

Reference. P. W. ... and A. M. H. Gray. 1924. *Brit. Journ. Derm. and Syph.* 36, 542.

CHAPTER XI

THE SEBORRHŒIC DERMATOSES

(*Lat sebum* tallow *Gk rhoia* flow)

Pityriasis—Seborrhœic Eczema and Dermatitis—Seborrhœic Sycosis—Acne Vulgaris—Acne Necrotica—Rosacea

In this section we deal with a related group of affections which arise from a variety of causes in subjects of a particular constitutional pattern —the seborrhœic state or diathesis.

Some of the reactions are peculiar to certain age periods and different reactions may arise in the same subject at different times and from different causes.

The dermatoses under consideration are the following —

Pityriasis capitis. (*Dandruff Scurf of scalp*)

Pityriasis corporis (Pityriasis circinata Flannel rash.) A ringed scaling eruption of trunk and limbs an extension of pityriasis capitis

Simple eczematous dermatoses arising on seborrhœic sites sometimes as a consequence of the pityriasiform eruption. These eczematous eruptions are of the usual patterns—erythematous, squamous, papular vesicular and weeping as well as the lichenified (neurodermatitis) and generalised types and pompholyx of hands and feet They receive brief mention here Further reference should be made to the section on eczema.

Infective seborrhœic dermatitis and sycosis affecting similar sites and commonly arising on one or other of the above eruptions. It is characterised by intractable pus-coccal infections.

Acne vulgaris—a follicular eruption commonly pubertal characterised by blackheads and secondary infection of sebaceous glands and other acneform eruptions as acne varioliformis

Rosacea a papular eruption and erythema of the flush areas of the face commonly menopausal

A marked degree of seborrhœa—running of sebum—is natural to certain races and at certain periods of development as the prenatal pubertal menopausal and senile If the flow is reduced or increased or is altered in character at these or at other times, it indicates a disturbed physiology Disturbances of function will be manifest in skin and mucous membranes and may be associated with functional disorders of other organs. The individual must therefore be considered as a whole for disturbance of function of one organ necessarily bears upon the behaviour of the other organs

The exciting causes of such disturbances are unlimited, *e.g.*, climatic infective and toxic nutritional and metabolic psychological and endocrine traumatic and environmental—but factors of fundamental importance are the endocrine balance and psychological state

One consequence of such disturbance is the alteration in resistance and in sensitiveness of the tissues especially skin and mucous membranes to irritants and to infection from organisms normally saprophytic and from pathogenic organisms.

The clinical features of this important group of skin diseases are distinctive, but divergent opinions are held as to the causes of the observed phenomena. Before discussing the histology and symptoms it will be of advantage to consider (1) the nomenclature (2) the micro-organisms believed to be concerned, (3) the soil, *i.e.*, the peculiar characteristics of the skin, and (4) the subjects of those disorders.

(1) *Nomenclature.* This is particularly unfortunate, for the name "seborrhœa," which literally means flow of sebum, has been applied to (a) hypersecretion of sebum (b) the cause of this increased secretion; (c) any kind of greasy exudation on the skin, whether from the sebaceous or from the sweat glands (d) dry scales upon the scalp, the so-called "seborrhœa sicca" and (e) a group of eruptions characterised by greasy scales. This terminology is especially inappropriate in the case of "seborrhœa sicca," a name given to the common dry scaling of the scalp, popularly known as "dandruff" or "scurf" There is no excess of sebaceous secretion in this condition, and the flakes are composed of epidermal scales containing micro-organisms, which are the probable cause. The name given by Willan, pityriasis capitis (Gk. *pityron*, bran), appears to be the most convenient, and it will be used here. Pityriasis, it may be mentioned, is commonly applied to some other scaling eruptions, pityriasis rosea, pityriasis rubra, pityriasis (tinea) versicolor pityriasis rubra pilaris.

(2) *The microscopic flora* believed to be concerned in the production of these conditions are (a) The pityrosporon, previously called the *spores of Malassez*, or bottle bacillus of Sabouraud, or the "flask-shape bacillus" of Unna, or the "balloon" bacillus of Hodara, a parasite more closely related to the yeast fungi than to the bacteria, is found in the epidermal scales of pityriasis capitis and in the other eruptions which have been grouped as "seborrhœides." Sabouraud points out the similarity of the epidermal affection it produces with pityriasis or tinea versicolor which is caused by the *microsporon furfur* Dowling and MacLeod claimed to have first cultured the fungus in 1926 but they and subsequent investigators believe that the organisms isolated by culture are *monilia* of which the pityrosporon may possibly be a variant.

(b) The *staphylococcus epidermidis albus* a coccus growing on media in greyish white cultures. This organism, called by Unna the "morococcus," from its development in mulberry-like masses, is found in colonies in the greasy scales of pityriasis capitis and in the scaly eruptions with greasy scales upon the trunk and elsewhere. The organism is one of the common saprophytes present upon the skin, but under certain conditions of warmth and moisture and probably an oily habitat, it becomes unduly prevalent and forms colonies.

(c) The *micro-bacillus of acne* The *corynebacterium acnes* one of the diphtheroids of the skin, is a small rod-like Gram positive organism, or group of organisms, growing preferably in anaerobic media, found in the lesions of acne vulgaris, and in the oily plugs which can be readily expressed from the large sebaceous glands of the nose, etc., in oily seborrhœa.

(d) The *pyogenic staphylococci* are frequently found in acne and some of the seborrhœic eruptions.

(3) The character of the skin in patients liable to the affections under discussion is important The colour is often dull, muddy or yellowish

the surface is greasy and the sebaceous orifices are unduly patent. There is often hyperidrosis also the sweat being not only excessive but naturally conserved by the oily film A luxuriant growth of hair is not uncommon at or about puberty Later hypertrichosis may be a great trouble to the female patients *The greasy and moist conditions of the* skin favour the growth of organisms.

There is *often vaso-motor instability* with perniosis Seborrhœic skins react by wheals more easily than the normal and are susceptible *to external irritants e.g* industrial

(4) The **seborrhœic diathesis** It has been indicated that among the constitutional peculiarities met with in this state are a susceptibility of skin and mucous membrane to irritation and infection. This often leads to chronic catarrh and sepsis in accessory nasal sinuses, to pyorrhœa and dental caries (soft teeth) and sepsis

Dyspepsia and constipation may arise early in life and may give rise to nutritional and metabolic disturbances The urine of the seborrhœic subject tends to be acid and particularly so at times of active eruption *when the administration of alkalies is beneficial. Excess of fats,* sweet and starchy foods—not well tolerated by these subjects—may have some *bearing upon etiology and a relative deficiency of some constituents of* the vitamin B complex is implied by biochemical and clinical observations.

Nervous instability is often marked and may be a factor of major importance

There is no doubt that inheritance and race are important and the evolution of the sexual function, attended with rapid development of the appendages of the skin as indicated by growth of hair etc. plays a prominent part in the etiology of the diseases here discussed Age has a marked influence the common time for the appearance of pityriasis capitis being between six and ten years acne vulgaris is found between puberty and twenty five a little later some degree of alopecia not necessarily related to pityriasis, develops and in the forties rosacea is common In the elderly we get the development of seborrhœic warts and keratomata. Particularly *intractable* seborrhœic eruptions are seen at puberty and the menopause and in adolescence

The distribution of the eruptions is also characteristic Pityriasis capitis affects the scalp pityriasis corporis and the seborrhœides affect the sternal and interscapular regions and flexures acne and oily seborrhœa favour the nose and naso-labial sulci the temples, forehead and chin and the back and chest

General treatment In the treatment of any seborrhœic affections the metabolic dietetic psychological, climatic or other general considerations may call for attention over and above any treatment of the skin.

The nature of the employment, the humidity heat, dust, etc., may bear upon the course of such affections Thus work underground in coal mines is unsuitable

Tropical and subtropical climates are contra indicated.

Psychological treatment and the use of mild sedative-tonic measures *may* be necessary

Endocrine therapy particularly thyroid and œstrogen hormone, has a place in the treatment of some of these disorders.

Diet should be of high protein and vitamin content with restricted carbohydrates and fats.

Alkalies are often desirable, sufficient to keep the urine slightly alkaline.

Dental toilet and treatment of any nose or throat sepsis are important.

Pityriasis capitis Dandruff Scurf

A chronic parasitic affection of the scalp characterised by the formation of easily detached scales.

Etiology Dandruff usually appears first in childhood, between the ages of six and ten. It is exceedingly common, and if due to a parasite, as is believed, this organism must be widely spread, and there is, therefore, great difficulty in tracing contagion. Many members of a family may be



FIG. 92.—Pityriasis capitis with alopecia.

affected, and the tendency appears to be hereditary Many acute attacks of seborrhoic dermatitis have quickly followed a visit to a hairdresser but whether a more virulent organism was acquired or an existing infection was activated by some application, friction or overheating is a moot point.

Pathology In the dry scales of pityriasis large numbers of the spores of Malassez (Pityrosporon ovale) are found, and these are believed to be the cause of the affection. The organism is confined to the superficial layers of the epidermis the scales themselves being composed of corneous cells, mostly without nuclei. Sabouraud says that there is no alteration in the sebaceous glands. In the *greasy* scales there is, in addition to the spores of Malassez, the *staphylococcus epidermidis albus*, growing in mulberry like masses. The lesions consist of epidermal scales with spaces containing serum which has coagulated (Sabouraud). The condition may become eczematised, when on removal of the scale or crust a moist oozing surface is found. It is clear that one phase may pass imperceptibly into the other

Clinical features The affection is almost absolutely limited to the *hairy scalp and particularly attacks the* vertex, upper parts of the parietal, temporal and the retro-auricular regions. The affected areas are covered with greyish or earthy-coloured epidermic scales The squames are powdery lamellar or branny easily detached and constantly fall on the clothes. At this stage the hair is unaffected. Pityriasis *is common in* infancy when it is most readily controlled It may persist during child hood and at puberty a change often occurs, the scales are thicker and have a yellowish colour and look greasy They do not fall so easily but the hair begins to come out at first in small amount in the warm weather only or after excessive perspiration, but later a moderate defluvium may occur all the year round The crown and the temples are the parts most affected

In some patients *the* disease is of the dry scaly variety for years in others the greasy character with early fall of hair is the important feature. *Seborrhœa using the term in the strict sense is often associated with* pityriasis. The skin becomes greasy the sebaceous glands are patent and acne vulgaris develops. *Scaling of the edges of the eyelids*—squamous blepharitis—is dependent on pityriasis capitis and responds to treatment of the latter the lids requiring a mild antiseptic ointment

Diagnosis. In psoriasis the scaling is harder drier silvery more abundant and localised than in pityriasis capitis Small spore ringworm of the scalp only occurs before puberty is associated with broken hairs and stumps and shows characteristic fluorescence under the Wood s glass and fungus under the microscope

Pityriasis corporis **Flannel rash.** This has long been recognised as a *clinical type of parasitic eruption affecting the trunk and spreading* sometimes to the upper segments of the limbs It is associated with pityriasis capitis The lesions appear on the sternal and interscapular regions and tend to keep to the middle line of the trunk particularly involving the sweat furrow of the back From these median areas the eruption may spread until large parts of the body and the upper arms and the thighs are affected The primary spot is small of a pink colour and covered with a greasy scale Each spot spreads to become a small disc or oval which usually clears up in the centre to form a ring The rings, complete or broken by *their junction form the figured lesions to which Unna* gave the appropriate name petaloid The margin of the ring is red and always covered by the greasy scale while the centre often presents a pale dull yellow tint, which recalls tinea versicolor (Plate 10) Sometimes there is fine furfuraceous scaling in the middle of the rings There is no infiltration The patient may complain of itching but this is not often sever

Diagnosis Pityriasis corporis is distinguished from pityriasis rosea by the tendency to form circinate figures, its distribution and the absence of the herald patch. In tinea versicolor the *café-au-lait* colour is distinctive and the *microsporon furfur is easily found* under the microscope in the scales mounted in liquor potassæ Some forms of tinea of the scaly variety might show a similarity but they are not likely to be limited to the middle line of the trunk and if there should be any doubt the microscope at once dissipates it.

Seborrhoeic eczema and dermatitis This may be acute, subacute or chronic Its origin in a scurfy scalp makes the diagnosis easy but the

PLATE 10



Pityriasis Corporis Circinate Seborrhoides.

Showing the petaloid arrangement of the lesions, which are scaly at the margins. The trunk and upper part of the arms and thighs were affected.

PLATE



"CORONA SEBORRHOICA"

The red area covered with greasy scales extends in a band below the margin of the hairy scalp. The patent sebaceous follicles and greasy character of the skin of the nose, etc., are shown. The patient has since lost much of the hair on the temples.

on in the inflammatory reaction is

subject has an irritable and unduly atous reactions which do not differ grouped papulo-vesicles of eczema sions of the scalp trunk and limbs. e factor the prognosis is somewhat czema, but eczema may arise in ling dandruff. The importance of ies in the indication for soothing

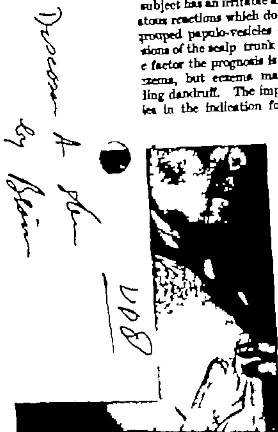


FIG. 89. Seborrhoeic dermatitis (intertrigo) eczematous.

applications, sedatives and measures of desensitisation by X rays or autohæmotherapy

As already mentioned, there may be no active inflammation for years, but the patient may complain of itching and heat from time to time. Then some alteration in the general health, worry or anxiety or perhaps the application of a stimulant lotion, causes a change in the character of the disease The irritability of the scalp increases, the surface becomes hot and red, and there is an excessive production of epidermal scales of a flaky greasy character The inflammatory redness of this seborrhoeic dermatitis may not be limited exactly to the hairy scalp but spread beyond it, forming a narrow band along the upper part of the forehead and the temples. This is sometimes called the "corona seborrhoica," and is illustrated in Plate 17 where the greasy character of the skin is also shown. The affected area is usually dry but slight irritation may cause considerable serous exudation, which on drying forms masses of crust. A

similar condition may spread from the occipital region on to the nape of the neck and down the back, or in the retro-auricular sulcus.

According to Sabouraud seborrhœic dermatitis is more of the nature of an impetigo being caused by cocci and the association of staphylococcal infection is very common. One frequently meets with small pustules in the follicles (Bockhart's type of impetigo) on the nape and elsewhere in patients with greasy scales on the scalp; boils may also occur.

In severe cases the eyebrows may be affected. The areas are red and covered with greasy yellowish scales and they may become eczematised. Blepharitis is often associated with this condition. The moustache region may suffer likewise, but if the beard area is affected the scales are generally of the dry powdery variety. With the scalp affection there may be scaly patches on the face and, according to Sabouraud, these are due to pyogenic cocci. Retro-auricular intertrigo is common and other folds and creases may be affected. There may follow a widespread eruption on trunk and limbs, of round and oval scaling red lesions, irritable and tending to vesication or lichenisation.



FIG 91. Chronic pus-coccal seborrhœic dermatitis.

Chronic seborrhœic dermatitis may follow the acute or subacute varieties on the head and face, ears and neck, or persistent erythematous areas may be found in the axillæ, flexures of the arms, or as intertrigo beneath the breasts, in the navel and groins or gluteal cleft. When the colour is pale and soft scales are present the seborrhœic lesion is not difficult to recognise, but deeper coloured and non-scaly lesions are more suggestive of psoriasis in spite of the anomalous flexural distribution. The distinction between some cases of psoriasis and seborrhœic dermatitis may be very subtle and since both diseases are common, psoriasis is bound to occur in a seborrhœic subject and then a flexural distribution might be expected. A similar diagnostic difficulty is met with in the case of the chronic lichenised seborrhœides which may be found in the previously mentioned sites or in the lower lumbar region. Psoriasis and the rare psoriasiform epithelioma also occur in the latter site.

Pus-coccal seborrhœic dermatitis and sycosis. Pustular reactions may follow either of the above conditions. The skin of any or all the seborrhœic sites becomes red, glazed and highly sensitive and is studded with small flat pustules which may be follicular in hairy sites and assume the characters of a sycosis. A chronic raw red dermatitis of the edges of the eyelids, sometimes ulcerative and pustular, is associated with this condition. It is improved by an ointment of ½ per cent. gentian violet with 2 per cent. salicylic acid in an emulsified base. This state tends to be

chronic and intractable, is frequently associated with profound nutritional metabolic or psychological disturbances and may be influenced by chronic septic foci in accessory nasal sinuses or other sites. Miners are particularly prone to such affection and cannot usually be cured so long as they continue employment underground. Jews are also subject to this type of disturbance

Local treatment of pityriasis and seborrhœic dermatitis. We have left the consideration of the treatment of these affections till the clinical features of the whole group have been described, for the trunk eruptions are so intimately connected with the scalp condition that one should not be



FIG. 83. Seborrhœic dermatitis showing sternal, submammary and umbilical distribution of petaloid lesions.

treated without the other From the point of view of prevention the treatment of the scalp is of great importance. The habit of the patient as regards the toilet care of the skin and the nature and cleanliness of linen should be of high standard. Cotton and not wool should be worn next the skin.

Treatment of the scalp. Where there is a constant accumulation of scales shampooing at regular intervals is necessary The following shampoo lotion is very useful: Soft soap and spirit equal parts, to which may be added thymol 10 grains or sulphur precip. 30 grains or liq picis carb. 1 drachm to the ounce The soap should be thoroughly washed out with fresh water A quillaia shampoo may also be used, one to two teaspoonfuls of fluid extract of quillaia being added to half a basinful of warm water

Cetyltrimethyl ammonium bromide (C.T.A.B.) is an effective modern soapless shampoo. The shampooing should be done every two or three weeks, but if the scalp is greasy the washing may be repeated more frequently. The regular use of lotions containing resorcin 15 to 20 grains to the ounce with 15 minims of glycerin, or spirit, is useful in mild cases. It is better not to use resorcin if the hair is very fair as it may tend to darken it. Euresol, a monoacetate of resorcin, is of great service and is free from this disadvantage. Instead of resorcin, salicylic acid may be used in the



Fig. 96. Seborrhoeic sycosis.

same strength or perchloride of mercury 1 in 2,000 or tar. A useful formula is:—

℞ Hydrarg. perchlor. gr. ½
Euresol grs. 10 (or Resorcin)
Liq. picis carb. m. 10
Spirit. m. 180
Aq. rosemari ad oz. i

In some cases an ointment suits the condition better and the scalp, unless inflamed, will tolerate antiseptics such as salicylic acid 10 grains to the ounce, with or without sulphur 10 grains to the ounce of an emulsifying base. Mercurials are sometimes advantageous, and the red or yellow oxide 5 grains to the ounce with oil of cade or anthrasol ½ a drachm to

the ounce, may be applied. Mercury may also be used in combination with sulphur as in the following formula hydrarg bisulphid. grs. 4 sulphur precip. grs. 15 to one ounce of ung aquosum. Emulsifying agents are desirable for scalp pomades to facilitate removal by washing

Where the eruption spreads from the scalp to the face the calamine lotion or liniment is usually of service. Ichthyol 10 minims to the ounce may be added to the liniment and sulphur precip 2 per cent. to the lotion.

For the eruptions on the trunk there is nothing so satisfactory as sulphur which may be used in various strengths or as a combination of sulphur and salicylic acid of each 10 grains to an ounce of petroleum ointment or in a paste with starch. Cinnabar is another useful remedy which may be

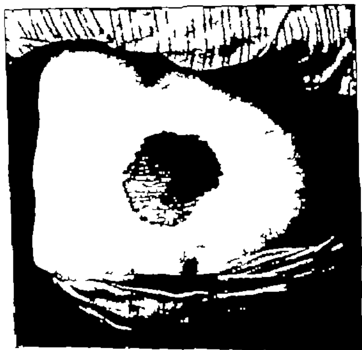


Fig. 67 Psoriasiform seborrheide. Large plaque in sacral region.

combined with sulphur as in the scalp ointment previously mentioned. Resorcin 2 per cent. in zinc paste or Lassar's paste is a popular remedy If the eruption is of great extent the stronger preparations must be used with care, or part of the eruption should be treated at first to see how it bears the application. The addition of 1 or 2 per cent. of liq carbonis detergens to the preparations is useful if there is much itching

Local treatment of seborrheic eczema or acute dermatitis. In the acute phases these antiseptic measures are inappropriate and harmful. Indeed, too vigorous treatment of a simple pityriasis may provoke eczema or dermatitis.

In an acute eczema or dermatitis soothing measures appropriate to these reactions must be employed. Calamine lotion or liniment, zinc

cream or Lassar's paste sometimes with tar and fractional doses of X rays (50–150 r) are of value. The aniline dyes, which are non irritant, are suitable and potassium permanganate baths may be prescribed in extensive cases.

Where there is a pus-coccal dermatitis or sycosis local treatment may include starch and boracic poultices for removing scabs, the aniline dyes, *penicillin creams or spray, 5 per cent sulphathiazole* paste (used with caution for short periods), ung. quinolor co. (Squibb) and fractional doses of X rays among other useful remedies.

Eau d'Alibour (zinc sulph. gr. 6, cupri sulph. gr. 4, aq. camph., ad oz. 1) used with equal parts of hot water is to be recommended in the treatment of sycosis.

General treatment as indicated in the early part of this chapter is applicable to all cases but is of least importance in the simple pityriasiform eruptions. *In acute manifestations, alkalinisation sufficient to produce an alkaline urine is desirable.*

In the eczematous states a mixture containing bromide, belladonna, nux vomica and gentian or quarter grain doses of phenobarbitone are necessary.

In the infective seborrhoeic dermatoses sulphonamides by mouth—sulphathiazole 0.5 grm. t.d.s. for ten days—or penicillin are of value. In these cases also it is of the highest importance to search for and deal with *any foci of infection.*

In all cases a diet rich in protein and fresh foods and restricted in carbohydrates, fats, fluids and salt is beneficial. Dried yeast tablets 3–6 after meals, supply the necessary vitamin B complex.

Many of the more chronic dermatoses respond well to oestrogenic therapy.

The nature of the employment and the psychological adjustment of the patient may call for careful consideration. On this account seborrhoeic disorders have been a frequent cause of disability in war workers both in industry and in the armed forces.

Acne vulgaris

A chronic dysfunction of the sebaceous glands manifested by the hyper secretion of pasty sebum and plugging of the follicular orifices with keratin, thus giving rise to comedones or blackheads. The retained sebum having a high bacterial content is very apt to set up an inflammatory reaction leading to suppuration which is maintained by the "foreign body" effect of the central fatty mass.

Etiology. The hormones of the sex glands (and possibly others) play an important part in the etiology of common acne. Age is an important factor, acne beginning at puberty and rarely lasting beyond the twenty fifth year or occurring *in married women. The activity of the appendages of the skin at this age has already been mentioned.*

The influence of hormones is found in cases of adrenocortical tumours causing precocious puberty. Even in young children the secondary sexual characters of precocity may be accompanied by acne of the pubescent type. A similar early development of the dermatosis has been seen in virilism in girls. In the hypo

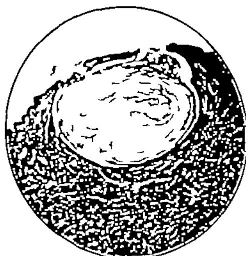


Fig. 98. Acne vulgaris. Comedo. (1 inch objective.)
(Section kindly lent by Dr Benians.)



Fig. 99 Acne vulgaris.

gonad condition, known as eunuchoidism, which may follow mumps typhoid fever etc., injections of testosterone propionate have not only produced growth of pubic and axillary hair and beard but facial acne has developed. The pubescent type has also occurred with Cushing's syndrome.

The skin of the subject of acne is oily the sebaceous glands are unduly patent or plugged, the complexion is muddy and there is usually pityriasis

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Clinical features. The comedo is a small black or dark brown point, slightly elevated above the surface. It varies in size from a pin's head to a millet seed, and is always situated at the mouth of a sebaceous follicle. By compression between the thumb nails a yellowish white greasy worm like mass with a dark cap is extruded. These masses, usually minute, may approach a centimetre in length. The cap is composed of keratin and inspissated sebum with imprisoned dirt. The comedones are found on the face, especially on the nose and nasolabial sulci, on the temples and cheeks, and often in the ears. The upper part of the chest and the back, sometimes nearly as low as the sacrum, are also affected in severe cases (Fig. 100).

In some patients the comedones are the special feature, in others the lesions pass on to a second stage, but comedones are always present. In this second stage the follicles are inflamed, the eruption consisting of papules of a red or purplish colour slightly pointed, and after two or three



FIG. 101. Acne conglobata.

days showing a minute yellow spot at the summit. The papules vary from a pin's head to a small pea in size. The yellow summit ruptures and a small quantity of thick pus escapes, and the spot begins to shrink but is apt to remain as a small red papule and to suppurate again if the central comedo has not been liquidated or expressed. In many instances the lesions undergo retrograde changes without the evacuation of pus. The subsequent fibrosis and atrophy may leave small pits or the scars become hypertrophic as ugly keloids. The face and the chest and back are the common sites of the eruption. There is little pain.

In some cases, however, the benign course described above is not followed. The abscesses increase to the size of a large pea or become irregular or elongated from the fusion of suppurative foci in adjacent glands. The surface is purplish, the swelling indurated, and there is considerable pain. On evacuating such a lesion one is often surprised by the large quantity of thick inspissated pus or blood-stained sero-pus which

capitis These conditions form a suitable soil for the development of the *micro-organisms* Dyspepsia constipation and perhaps dietetic errors may play a part Whitfield is of opinion that excess of starch, sugar or fat in the food increases the secretion *apart from indigestion*

Pathology The comedo is a worm like mass composed of inspissated sebum, cells from the lining of the pilo-sebaceous follicle and a cocoon-like mass consisting of an enormous number of micro-bacilli the bacillus of seborrhœa of Sabouraud or *bacillus acnes* This organism or as Western

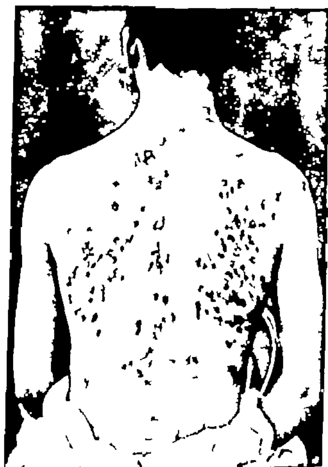


Fig 100 Severe acne of the back. Male aged 17

has suggested this group of organisms, is Gram positive and grows by preference on anaerobic media Various investigators claim different characters culturally and it is probable that there is not one *form* but several and this would account for the disappointment attending treatment by vaccines. In the second stage the sebaceous glands are converted into pustules. There is infiltration of cells in and around the glands, and sometimes two or more adjoining lesions coalesce to form a deep-seated extensive abscess cavity The abscesses may be superficial or deep, and usually run a very chronic course. From them are obtained the acne bacilli and *various forms of* cocci which do not appear to be of the virulence of the pyogenic staphylococci.

is an anemic factor to be corrected. Concentrates of vitamins A and D and ascorbic acid 50 mg b.d. are often of value. As tending to increase the resistance of the patient to the bacterial invasion, fresh brewer's yeast, a tablespoonful twice a day may be given, or tablets of dried yeast. In chronic cases the use of vaccines has sometimes proved valuable, but the method should be reserved for the refractory cases of pustular acne.

An autogenous vaccine is probably most effective and a polyvalent one containing acne bacilli, staphylococci and streptococci is often used. If staphylococcal abscesses are the main clinical feature a mixed toxoid vaccine may be more effective.

The *local* treatment is very important. Where there are numerous comedones and little pustulation, the face should be washed with a 5 per cent. sulphur or sulphur and balsam of Peru soap and bathed freely with hot water afterwards. If the skin is greasy borax, sodium bicarbonate or washing soda should be added to the hot water The process is followed by brisk friction with a soft towel. This should be done nightly Removal of the comedones is also advisable, but must be done with care. Where there is much pustulation the treatment must be less energetic. The bathing may be continued and the pustules and deep-seated abscesses should be punctured with a fine pointed knife, the narrower the blade the better and the pus expressed. Some advise swabbing the cavities with carbolic acid, but if properly emptied, they heal up satisfactorily Another method of dealing with the early inflamed comedones is to fulgurate them with a minimal diathermic current, or cauterise them with phenol or the galvanocautery

Lotions applied to the parts are often very useful. A good one is the following Milk of sulphur alcohol, and water in equal parts, to which is added one-tenth part of gum mucilage. This is applied night and morning Another useful preparation is 5 to 10 per cent. of zinc sulphate and potassa sulphurata in water dissolved separately and equal volumes of the solutions mixed.

A good routine lotion is lotio calaminae with the addition of 2 per cent. of sulphur precipitata. Two per cent. of phenol may be added to combat infection. Titanium di-oxide prescribed as Siccolam (B.D.H.) is a valuable application.

A stronger antiseptic lotion of hydrarg perchloride, gr 1 salicylic acid grs. 10, Industrial spirit, half an ounce, and camphor water to one ounce is of service and may also be used on the scalp which is often greasy and scurfy Some degree of peeling often follows the use of the stronger lotions and exfoliation is a recognised method of removing the horny plugs obstructing the sebaceous follicles. Full erythema doses of ultra-violet light may be used, but a peeling paste is more effective This consists of 6 to 12 per cent. of resorcin and sulphur in Lassar's paste. It is applied thickly at night and removed in the morning when the calamine and sulphur lotion mentioned above should be used.

Radiotherapy As a routine 150 r units of X rays may be given every two or three weeks for 3 to 4 doses but when seborrhoea is well marked it is best to give 200 r at two week intervals for three doses since the larger doses still safely below the erythema dose of rays, have an inhibiting effect

is removed This cold abscess formation (non tuberculous) may be a severe and very disfiguring complication and may give rise to ugly keloidal scars Its onset may be sudden and the reason for this obscure it may as suddenly subside and it is not always wise to interfere surgically

The term acne punctata is applied to a condition characterised by numerous comedones The terms acne papulosa, "acne pustulosa," and "acne indurata describe the other forms.

The course of the eruption is essentially chronic, with periods of activity and remission often depending to some extent upon the condition of the general health

Diagnosis The diagnosis of acne is usually easy The presence of the comedones and the peculiar limitation to certain regions are characteristic. It must be remembered however that certain drug eruptions simulate acne very closely Many patients who take bromides for a long time suffer from an acne-like eruption, and one form of iodide eruption is very like the pustular form of acne The history would be of great assistance in the differential diagnosis, but the absence of characteristic comedones is of importance and if necessary an analysis of the urine may be made. It is interesting to note that a third member of the halogen group of elements, chlorine produces an acne-like eruption, often very severe, but closely simulating the common type It occurs in chlorine workers and a milder type has been seen in habitués of public swimming pools where the water is chlorinated Workers in tar frequently suffer from an acneiform eruption (Fig 159) and the medicinal application of tar and oil of cade in the form of an ointment produces in some subjects a papulo-pustular eruption rather like acne but the history would set at rest any doubt as to the cause. Acne-like lesions may be produced by the heavy lubricating oils, but they are usually on the forearms (Fig 157) and we have seen unusually prominent comedones in young subjects who turn bakelite or ebonite on lathes.

Grouped comedones in infants are considered at p. 216

Prognosis A guarded prognosis should be given. Acne often runs a very chronic course but tends to disappear spontaneously at the age of twenty five but necessary treatment should never be withheld on this account for some sequelæ will then be permanent

Treatment *General* Exercise in the open air is important. The disfigurement particularly in young girls, tends to their staying too much indoors The diet requires supervision. Sweets, pastry fatty and highly seasoned and salted foods, entrées, etc., should be avoided. Plain, simple food with plenty of protein green vegetables, salads, and raw fruit, are advisable Adequate vitamins B and C are essential The dental condition may require attention and care should be given to thorough mastication Any tendency to constipation should be met by salines. In sluggish types a small dose of the dry extract of thyroid may be given in sensitive subjects phenobarbitone gr ½ daily is of value If there is much pustulation sulphathiazole 0 5 grm t.d.s p c for ten days may subdue this complication

Recently the administration of œstrogenic hormone has been found beneficial in certain cases particularly in overgrown, precocious youths with more severe types of acne Stilbœstrol 3–5 mg daily for one week and 1 mg daily for six weeks is the usual procedure In many cases there

size on the chest, and rarely on the cheeks, forehead, scalp or back. The follicles are plugged with a horny mass with a black summit. There may be no evidence of inflammation, but sometimes there is an areola of redness round each comedone. In the case figured (Fig. 102) there was extensive



FIG. 102. Grouped comedones from camphorated oil.

inflammation with suppuration on the chest. The disease sometimes affects several members of a family.

Treatment. This should follow the lines suggested for adult acne.

Acne necrotica (Acne varioliformis. Acne frontalis)

A chronic follicular affection of adults characterised by shotty papulo-pustules, commonly limited to the frontal area and often leaving small pitted scars.

Etiology. The patients are usually sufferers from oily seborrhoea and pityriasis capitis. Sabouraud believed the cause to be the *staphylococcus aureus*.

Pathology. The lesions develop in the follicles and consist of papulo-pustules with necrosis of the epidermis and of part of the true skin.

Clinical features. The eruption consists of small red swellings around the orifices of the follicles. They are soon surmounted by small pustules

upon the sebaceous glands *Six months* should elapse before repeating a course of X ray therapy

Acne conglobata may be regarded as the deepest and most extreme variety of pustular acne manifest by colliquative necrosis, deep abscesses, granulomatous ulcers and severe scarring The affection may be familial The condition is peculiar to men over the age of twenty and usually affects the shoulders, buttocks or thighs but may develop on other parts including the scalp and face The process begins as a follicular or peri follicular inflammation of a granulomatous type very suggestive of a necrotic tuberculide and showing the same brownish red or purplish colour Indolent deep abscesses form under the discoloured skin which break down to discharge green yellow or blood stained pus and leave chronic sinuses or extending serpiginous ulcers with thin, undermined edges. The resulting scars are often hypertrophic or keloidal and may form bands and bridges resembling those of scrofuloderma We have seen cases in which the entire buttock or axillary regions were undermined with con fluent abscesses. As a rule many large comedones and pustular acne lesions of all sizes and in all stages of evolution are present on the back and chest and face and neck which makes the diagnosis simple but sometimes the signs of acne are few or absent and then the diagnosis of the granuloma tous lesions presents a difficult problem In a descending order of proba bility tuberculosis, blastomycosis bromide or iodide granulomata and syphilis have to be considered and excluded by the appropriate tests and examinations In acne conglobata staphylococci, streptococci and diphtheroids are usually found in the pus but some of the closed abscesses may be sterile and may be regarded as pustular and necrotic bacterides, the staphylococcus aureus being most suspect (Fig 101).

Treatment should follow general principles The prognosis is bad

Perifolliculitis capitis abscedens et suffodiens. Described under the above title or as dissecting cellulitis of the scalp is a condition closely resembling acne conglobata but limited to the scalp The abscesses are smaller than in the latter condition and they are frequently connected by horizontal sinuses above which the hair is destroyed as it is over the abscesses. The resulting scars are often hypertrophic.

Grouped Comedones in Infants

A rather uncommon affection of young infants and occasionally of school children characterised by the formation of groups of blackheads, which may sometimes pass on to suppuration.

Pathology The cause is unknown but the spores of Malassez are present in large numbers in the comedones. In several cases examined by Dr C T Western no acne bacilli were found either in film preparations or in culture Cultures grew *staphylococcus albus* only Males are affected more frequently than females There is often a history of local irritation, such as the application of tallow plasters, camphorated oil, or of chest protectors of dirty flannel When grouped comedones arise after the use of grease on a seborrhoeic skin the eruption is presumably analogous to that known as oil acne

Clinical features. The lesions are localised to a single area of variable

size on the chest, and rarely on the cheeks, forehead, scalp, or back. The follicles are plugged with a horny mass with a black summit. There may be no evidence of inflammation, but sometimes there is an areola of redness round each comedone In the case figured (Fig 102) there was extensive



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Clinical features The lesions are localised to a single area of variable

condition of the skin, pityriasis capitis, etc., and acne vulgaris may precede it.

The basic factor in rosacea is a vaso-motor instability in a seborrhoeic subject. This instability is shown by the reaction to mental, physical and physiological stimuli. It is largely influenced by emotional upsets and especially by endocrine factors associated with the menopause

We are aware that in some cases there is evidence of gastro-intestinal disorder with or without chronic alcoholism and a few cases may be dependent on secondary congestion from cardiac or pulmonary disease



FIG. 104 Pustular rosacea.

At one time, stress was laid upon hypo-chlorhydria as a determining cause, but our experience suggests that emotional and endocrine factors are of far greater importance. We have rarely found fractional test meals of assistance in diagnosis, but they may be indicative of treatment.

As physical factors influencing rosacea must be mentioned the peculiar sensitivity of the affected areas to exposure to cold and changes of temperature.

Pathology The vessels of the true skin are dilated, and there is inflammation of the sebaceous glands. The dilatation of the vessels often becomes permanent, leading to telangiectases, which are sometimes a prominent feature The pustules which form in the sebaceous glands are

which dry to form yellowish crusts On the fall of the scabs small depressed scars are left The spots vary in size from 1–3 mm. in diameter The character of the pustules and scarring suggested the name varioliform The eruption comes out in crops, and particularly affects the forehead and temples but it often extends on to the hairy scalp for a short distance The auricles and the sides of the nose may be affected, rarely the upper part of the trunk Necrotic acne runs an extremely chronic course, and may last for years.

Occasionally the eruption extends over the trunk and limbs leaving pock mark scars and simulating a papulo-necrotic tuberculide or some forms of *dermatitis herpetiformis* It is not uncommon to see a mild discrete serous follicular eruption on the scalp and other parts, irritable and *often capped by a small crystal scab but not giving rise to scars.* It



FIG. 103 Acne frontalis. Male aged 42.

appears to be related to this affection and is sometimes termed acne *varioliformis minutissima.*

Treatment. The application of a carbolic or sulphur soap and rubbing *in ung hydrarg ammon* cures the eruption in a few weeks.

The affection however tends to be recurrent and commonly waxes and wanes with general and nervous health and tone which then call for attention

Rosacea Gutta rosea (Acne rosacea)

A chronic affection of the middle part of the face forehead and chin, characterised by erythema flushing telangiectases, and the formation of pustules.

Etiology Rosacea may begin about puberty but it is most common in the fourth decade *of life and tends to disappear in advanced* age. It is much more frequent in women than in men It is often associated with the group of conditions classed as seborrhoeic, an oily

condition of the skin, pityriasis capitis, etc., and acne vulgaris may precede it.

The basic factor in rosacea is a vaso-motor instability in a seborrhoeic subject. This instability is shown by the reaction to mental, physical and physiological stimuli. It is largely influenced by emotional upsets and especially by endocrine factors associated with the menopause.

We are aware that in some cases there is evidence of gastro-intestinal disorder with or without chronic alcoholism and a few cases may be dependent on secondary congestion from cardiac or pulmonary disease



FIG. 104 Pustular rosacea.

At one time, stress was laid upon hypo-chlorhydria as a determining cause, but our experience suggests that emotional and endocrine factors are of far greater importance. We have rarely found fractional test meals of assistance in diagnosis, but they may be indicative of treatment

As physical factors influencing rosacea must be mentioned the peculiar sensitivity of the affected areas to exposure to cold and changes of temperature.

Pathology The vessels of the true skin are dilated, and there is inflammation of the sebaceous glands. The dilatation of the vessels often becomes permanent, leading to telangiectases, which are sometimes a prominent feature. The pustules which form in the sebaceous glands are

not preceded by the formation of comedones. Many of the firm papules, pin head sized or larger, which arise in the skin of the "flush areas" are independent of the follicles. They are composed of aggregations of histiocytic cells, mostly mononuclear and plasma, occasionally giant cells, and present a structure somewhat resembling a "tubercle."

In the condition known as *rhinophyma*, an occasional sequel of rosacea, there is hyperplasia of the connective tissue and of the sebaceous glands and vessels. Numerous mast-cells are found in the meshes of the connective tissue, and recurrent lymphangitis increases the swelling.



FIG. 103. Rhinophyma.

Clinical features. Rosacea begins by the formation of diffuse or scattered red patches on the "flush area" of the cheeks, nose, and chin. Under the influence of changes of temperature the colour may become brighter or livid. After the taking of hot drinks, or sometimes after a meal (in many cases the midday meal) there is a tendency to flush, and the onset of the menstrual period often aggravates these symptoms. For a variable time these are the prominent features, but at length the vessels become permanently enlarged, notably in the naso-labial sulci and on the dorsum of the nose, on the cheeks, forehead, and chin. In the type called "couperose," by French authors, this condition persists. More commonly the sebaceous glands are obviously dilated. Small red papules develop on the smooth skin. They are granulomatous in character and may break



ACNE ROSACEA

Female aged 45. The plate shows the telangiectases and inflammatory papules on the flush area, forehead and chin, and corneal opacities from keratitis.

down and necrose and give rise to secondary infection. Follicular lesions as in other seborrhoic conditions occur but they are of the same type as those on the smooth skin. The rosacea elements are thus quite different from acne vulgaris. Occasional comedones may be present but are not part of the rosacea. Pustulation is a frequent complication. The pustules appear in small number from time to time, but are not preceded by comedones like acne vulgaris, and they rarely have the deep character of indurated acne. In some cases the pustulation is excessive, and there may be many abscesses scattered over the affected areas.



FIG. 106. Rhinophyma, after operation.

A variety characterised by small scattered papulo-pustules the size of a pin's head is described as a special affection by Brocq.

The lesions are usually most developed on the chin in women with uterine disorders.

Oily seborrhea is a common symptom in all types. Nearly all patients affected with rosacea suffer from coldness of the extremities.

Ophthalmic surgeons have long recognised that keratitis and corneal ulcer in adults are commonly associated with rosacea, the incidence being 5–10 per cent in our experience (Plate 18).

In the hypertrophic form or *Rhinophyma* the nose is swollen, bulbous and with soft nodular excrescences, covered by dilated vessels. The glandular structures are hypertrophic, and recurrent attacks of lymphan-

gitis are common This variety is most common in heavy drinkers. In the case illustrated the swelling was so great that the patient's vision was obstructed (Figs. 105 106)

The disease is essentially chronic and may last for many years

The *diagnosis* is usually remarkably easy the symptom complex flushing telangiectases and papulo-pustules in the middle of the face and on the forehead and chin being characteristic Lupus pernio might lead to difficulty but it is a rare condition, in which the surface is chronically cold and bluish and is often associated with lividity of the extremities and of the lobes of the ears

A rosacea like eruption occasionally arises as a tuberculide and was described by Lewandowsky We have seen it in association with tuberculous glands of the neck and Bazin's disease The lesions show more infiltration and the condition is resistant to ordinary treatment but may yield to gold injections

Treatment. The first point is to determine if possible the underlying cause and to treat dyspeptic conditions, constipation etc In many cases this at once relieves the symptoms The diet should be simple meals evenly balanced alcohol must be avoided and it is wise to limit the ingestion of hot fluids, particularly tea, coffee and condiments. Riboflavine and aneurin are sometimes of value

Tr belladonnae 5-10 minims in an alkaline gentian mixture is useful and in cases associated with hypohydrochlorhydria great benefit usually follows the administration of dilute hydrochloric acid (½ to 1 drachm) diluted with water or lemon water with the chief meals.

Sulphur grs. v t d in tablet or lozenge or collosol sulphur in drachm doses appears to suit some cases. Ichthyol internally may relieve the tendency to flushing It should be given coated with keratin or in capsules in doses of two and a half to five grains thrice daily Large doses of citrate of potassium a drachm thrice daily and also quinine are sometimes useful. Thyroid is recommended in rosacea occurring in women with hypothyroidism and in rhinophyma.

Emotional conditions are benefited by luminal gr ½ at night and endocrine defects at the menopause by stilboestrol

The *local treatment* is of importance. We have found that the technique introduced by MacCormac is remarkably successful It consists in giving 4-6 small fractional doses of X rays not exceeding 70 r weekly and the application of an ointment of sulphur and salicylic acid 2 per cent. of each. The application of a resorcin paste—resorcin 20 grains, zinc oxide and starch of each 22 grains, vaseline to one ounce—is sometimes of service Ichthyol ointment, 20 to 40 grains to the ounce or a weak sulphur preparation may be used Where the flushing tendency is marked the calamine lotion—calamine two drachms, zinc oxide half a drachm glycerine a drachm and aq calcis to four ounces—is useful to relieve the hyperaemia When washing aggravates the condition it should be discontinued One per cent of the strong solution of lead subacetate in boiled milk may be well tolerated and may be followed by a talcum powder medicated with ichthammol or sulphur The telangiectases are dealt with after the subsidence of the inflammatory symptoms. The best measure is electrolysis of the individual vessels, using a fine irido platinum needle which is inserted

into the vessel, and a current of two or three milliamperes is passed until it turns white. Telangiectases may also be destroyed by lightly touching with the galvano-cautery. In the hypertrophic cases the masses may be treated by multiple scarification, or if of great size, pared away. The latter treatment was adopted, with good cosmetic results, in the case figured.

cases. The disease affects the trunk and the proximal parts of the limbs first—in fact, the area covered by the vest or bathing suit—but it may extend to the forearms. The face, hands, legs, and feet are usually exempt, but may be affected. Haxthausen drew attention to the occasional occurrence of lesions on the scalp in children.

The evolution of the disease is highly characteristic. There is an initial lesion or "herald spot," usually somewhere on the trunk, or on the neck or a limb. This patch is red and scaly and may be mistaken for tinea circinata. The herald spot may itch slightly but is often overlooked by the patient, especially if on the back. The herald spot is observed in rather more than 50 per cent. of cases. It is often obvious from its size and character when the generalised eruption has developed. The eruption of spots occurs from a few days to two or three weeks after the appearance of the primary or herald lesion. The outbreak consists of rounded spots and medallions, first on the trunk following the lines of the ribs and then on



Fig. 107. Pityriasis rosea showing herald spot on shoulder

the adjacent parts of the limbs. They may come out in successive crops, but the eruption is self-limited, and after lasting from about four to six weeks the spots fade, the scales fall off, and the skin resumes its normal appearance without scar or stain. Itching is a very variable symptom. At times it is severe and may persist with the general eruption for two or three weeks. It is exceedingly rare to meet with a second attack in the same subject.

Slight pyrexia has been observed and also glandular swelling at the onset.

Pityriasis rosea gigantea. (Darier.) A very rare type in which the patches may cover an area of several square inches. The character of the eruption and the course are similar to the common type.

The diagnosis is important, and mistakes are not uncommon. Pityriasis is often diagnosed as syphilis, the eruption being taken for the macular syphilide unless itching is present. The essential points of difference are the colour, the variation in the size of the spots, and the scaliness. In syphilitic roseola the lesions are dull pink, all about one size,

and free from scales The scaly and lenticular syphilides are infiltrated and of a dull red colour General enlargement of the glands and affection of the mucous membranes are commonly absent in pityriasis. In a doubtful case the Wassermann reaction should be examined.

Eczema is excluded by the oval medallion like plaques and the primary patch and distribution of the eruption Seborrhoeic dermatitis affects often the same regions but the scalp is usually scaly and the trunk lesions are covered with greasy squames. In the absence of a herald spot it may be difficult to be certain of the diagnosis until the course of the eruption has been noted Seborrhoeic pityriasis clears readily under treatment.

In psoriasis the spots are a characteristic and deeper colour and well demarcated there is a silvery scaling and fine bleeding points are found when the scales are removed by scraping Erythema multiforme is distinguished by the purplish tint of the eruption its predilection for the distal parts of the extremities, and the absence of scaling and of the medallions and the presence of target lesions. Occasionally drug rashes (*e g* gold) may simulate pityriasis rosea Here the history may help diagnosis An eruption closely resembling pityriasis rosea in its early stages will sometimes be found in its further development to be lichen planus—so-called pityriasiform lichen planus. A peculiar brownish purple hue will sometimes suggest this likely development.

Prognosis Pityriasis rosea runs a self limited course and usually lasts from four to six weeks Recurrences are exceedingly rare

Treatment. No specific remedy is known. Alkaline aperients, small doses of quinine or grey powder and sedatives to allay irritation may be helpful Weak tar ointments, salicylic acid 2 per cent. in an ointment, and boric acid ointment are useful or calamine lotion with 2 per cent. of sulphur and 2 per cent of phenol All strong or irritant preparations should be avoided

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Psoriasis

(Gk. psoriasis mangy or scaly)

Definition. Psoriasis is a silvery scaling eruption of red, well demarcated lesions mainly affecting the scalp and extensor surfaces of the limbs.

Etiology In England psoriasis accounts for 5 to 6 per cent. of all skin diseases. It is prevalent in all classes of the community and affects males rather more often than females. It is rare before four years of age but may arise at any time after that, commonly appearing at puberty or less often at the menopause. It is rare for a first attack to arise later in life. In these later cases an associated arthritis of small and large joints may be present. Psoriasis tends to be chronic and relapsing and often shows seasonal exacerbations. It is less common in warm sunny climates. It is very rare in the negro

The cause of psoriasis cannot be found in any single etiological factor Microbic and parasitic organisms have been repeatedly suggested but no credible evidence has been brought forward to support these views.

Dietetic factors have received much attention, but their importance is inconstant.

For example, Schamberg advocated a low protein diet. Grutz laid stress on the presence of increased serum cholesterol and phosphatides and recommended the reduction of fats and eggs in the diet. Rost, in an investigation of glucose tolerance in patients with skin diseases, obtained an abnormal curve in 42 per cent. of psoriatics. It is probable that these may be associated factors but are not constant or significant. Van Kerckhoff regards psoriasis as a light-deficiency disease, having demonstrated a diminution of melanin and pigment cells in the basal layer of the epidermis. The naked negro, always in the sun, rarely gets psoriasis.

Various investigators have insisted on the importance of psychological factors. Whatever may be the true nature of psoriasis, it is helpful to regard it as an inborn peculiarity to react to injury of the skin by psoriasis

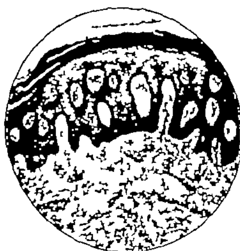


FIG. 108. Psoriasis.

instead of by the simple inflammatory reaction which would occur in a normal skin. This tendency varies and there is no doubt that susceptibility to psoriasis increases at times of physiological instability as at puberty and the menopause. Samberger regards psoriasis as the result of a congenital, sometimes hereditary weakness or dyscrasia of the keratin forming cells. Heredity is traceable in about one-third of the cases, but little is known of the mode of transmission.

Psoriasis may follow such trauma as vaccination, dog bites, insect bites, the puncture of a hypodermic needle, scratches of brambles, irritation of the skin from constricting clothing and irritant applications, an ordinary exogenic dermatitis, a burn, a boil, or irritation from discharges. Psoriasis may be seen with the reactions of other diseases of the skin of external or internal origin, such as seborrhœic dermatitis, lichen planus, intertrigo, and less commonly eczema and syphilis.

The commonest exciting causes of psoriasis arise from within and act

through the blood stream or sometimes through the nervous system. An acute generalised guttate psoriasis may be the sequel of the acute specific fevers influenza tonsillitis quinsy or other mild infection. Psoriasis may follow accidents operations and nervous shocks or strains. In women pregnancy or confinement may provoke a first attack or be the cause of an acute exacerbation Occasionally chronic psoriasis clears during pregnancy Nervous influences particularly in adolescence, must not be overlooked. Mental stress and strain aggravate the disorder and relaxations and



FIG 100 Psoriasis.

holidays favour remissions this is true of constitutional reactions in general.

Major illnesses may cause psoriasis to disappear or they may be responsible for the onset of an eruption in convalescence, when the patient has passed the severe stage of the illness and is debilitated

There is much to commend the view that psoriasis is a rheumatic manifestation; the association with infections of the upper respiratory tract, the occasional association with rheumatoid arthritis and more important, its response to varying climatic changes, notably exacerbations in the spring and autumn, and improvement in warmth and sunshine The tendency of psoriasis to avoid parts exposed to light must have some

significance It is perhaps the dermatological expression of a rheumatic diathesis. In general we may say that given a proneness to psoriasis, it may be provoked or aggravated by—

Puberty pregnancy menopause.
General debility and malnutrition.
Nervous debility worry anxiety etc
Infective and other toxæmias.
Climatic variations and
Injury to the skin—external or internal.



FIG. 110. Psoriasis.

It would seem likely that an eruption with features so constant and characteristic as those of psoriasis would have a specific cause in the skin but no such cause has been found. Some dysfunction of the oxidation reduction mechanism of dermal tissues may be conceived. Possibly some metabolite produced by various stimuli acting on some organ or body function or some failure of the skin to utilise certain normal metabolites brought to it might explain a specific mechanism determining the specific character of psoriasis, but no such mechanism has yet been demonstrated.

The toxæmia of chronic gonococcal infections occasionally provokes an eruption, keratodermia blennorrhagica (p. 288), which closely resembles psoriasis and was regarded as psoriasis by Adamson. It is often of the rupioid type though sometimes pustular and there is much to support Adamson's view

Morbid anatomy The chief histopathological features are capillary dilatation and œdema of the dermis and œdema, hypertrophy and thickening of the epidermis. The papillæ extend well into the epidermis and the epidermal interpapillary processes are prolonged into the dermis. Microscopically the papillæ which have penetrated in cork screw fashion almost to the surface of the epidermis, are seen in cross-section in a greatly thickened epidermis. Leucocytes in large numbers surround the capillaries, stream into the epidermis and collect in masses as plumes under the horny layer and are cast off as the dry micro-abscesses of Sabouraud-Munro in the scales. The œdema of the epidermis causes cell division and new cell formation in the Malpighian layer (acanthosis) in addition to the normal cell formation from the basal cell layer and these cells reaching the surface are immature retain their nuclei and are but imperfectly keratinized

(parakeratosis) As a result they adhere instead of being cast off and as they become desiccated air spaces form between the clumps of cells these spaces reflect the light and are partly responsible for the silvery white shining scales of psoriasis this is emphasised on scratching It is reasonable to imagine that the dry abscesses become ordinary macroscopic abscesses under exudative conditions and produce the clinical state of pustular psoriasis.

Psoriasis is entirely a superficial reaction partly vascular partly epidermal. It causes some pigmentation of the part affected and heals leaving little or much temporary discoloration but no scar Psoriasis sometimes causes depigmentation and leaves a leucodermia. It does not affect the mucous membranes

Clinical picture The sites of election of the silvery scaling erythema of psoriasis are the scalp elbows and knees and extensor surfaces of the limbs, but it may occur on any part of the body It may be confined to the elbows knees and scalp or it may arise in areas which have been damaged and be co-extensive with such injury

Itching is rare though occasionally it may be severe questioned about itching most psoriatics admit some irritation when warm.

The erythema of psoriasis is somewhat distinctive and can usually be recognised even in the absence of other features there is an admixture of brown in the red giving a colour resembling salmon red The lesions are always well demarcated unlike those in most other scaling erythemas. The scaling is considerable in the scalp psoriasis is readily felt, giving the impression of a miniature mountain range under the fingers by reason of the amount of scale The silvery white character of the scaling readily emphasised on stroking the scale with the finger nail is perhaps the most distinctive element of psoriasis If this scale is removed by scraping the stratum mucosum is reached and is seen as a moist red surface (membrane of Bulkeley) through which dilated capillaries can be seen as red points. These are often abraded in the removal of the scale and leave small bleeding points (Plate 20)

All these features the sites of election, the colour silvery scaling the demarcation of lesions the membrane of Bulkeley and the capillary bleeding are peculiarly distinctive of psoriasis and are important aids to diagnosis.

The form of the eruption varies widely Commonly an extensive eruption starts as a number of small punctate lesions scattered over the body—generalised punctate or *guttate* psoriasis. The guttate lesions may clear spontaneously or respond to treatment and disappear or they may increase regularly to that of coin-sized discs, *nummular* psoriasis. These small discs may be of the same or of different sizes Any of them may further proceed to large discoid psoriasis or to extensive plaques. Not uncommonly the lesions spread centrifugally while they clear at the centre *annular* psoriasis these ringed lesions may coalesce and form a *gyrate* or *figurate* psoriasis. The description of these numerous varieties of psoriasis should not occasion confusion, for the evolution of the pattern is readily understood.

In some cases psoriasis is pale and shallow in others it is livid and angry these features often indicating the severity and giving a clue to the

PLATE 20

Psoriasis

Characteristic patches about the knee. The flat red plaques are covered with silvery scales. One of the upper spots has been denuded of scale to show the vascular surface under it

(To face p. [illegible]

probable response to treatment. Scaling is sometimes slight, sometimes gross and occasionally so severe as to merit the names ostraceous or rupioid psoriasis, the heaped scales resembling the shell of an oyster or a limpet.

On the scalp psoriasis is almost invariably an eruption of discrete lesions with normal scalp between the lesions and not a diffuse affection involving the whole scalp, an important differentiation from seborrhoeic pityriasis capitis. When it affects the whole scalp, the margins are still well defined. The thick, hard, dry crusts are characteristic.

Psoriasis of the face is common in the industrial north but this does not appear to be a general experience. Exposure to light probably tends to



FIG. 111. Psoriasis annularis.

keep the face clear of psoriasis, and it may be that the light content of the industrial north of England is less than in the south and that this is responsible for the fact that there is more facial psoriasis in those districts than in other parts of the country. On the face the condition tends to lose its normal features and rarely has the characteristic colour or scaling. Since the condition is a symmetrical scaling erythema, the differential diagnosis from seborrhoeic dermatitis may not be possible without reference to lesions elsewhere. If markedly erythematous the condition may simulate lupus erythematosus.

On the trunk and limbs a psoriasiform eruption in seborrhoeic sites is recognised and is probably psoriasis provoked by seborrhoeic dermatitis, the result being a mixed reaction often resistant to treatment. Unlike

ordinary psoriasis flexor surfaces are in this type affected more than the extensor surfaces and the axillæ submammary regions and umbilicus may be severely involved. In the perineum, groins and natal cleft this type tends to be very irritating In these sites the characteristic colour and the definition and demarcation of the eruption may still be noted

Psoriasis of the penis, especially of the glans penis may present difficulties scaling is commonly absent itching is not pronounced and the well-demarcated persistent red thickened plaque may be confused with

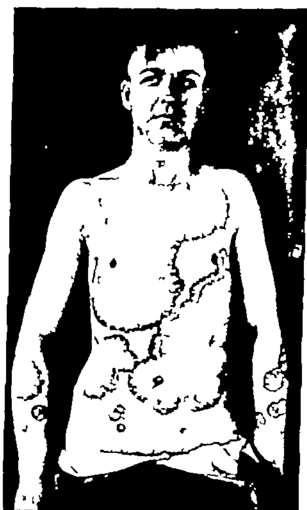


Fig 112. Gyrate or figurate psoriasis.

lichen planus with intra-epidermal carcinoma or with erythroplasia of Queyrat

Psoriasis on the hands and feet may assume various forms. It may have the ordinary characteristics of the disease but rarely presents much scaling It may be rather acute affecting mostly the dorsal aspects and simulating a toxic erythema or an acute lupus erythematosus and involving particularly the skin about the nail folds and dorsal aspects of fingers and toes This type is sometimes associated with vesication or soddening of the skin in the clefts between the digits On the palms and

soles the condition may be diffuse and chronic, giving a general fissured hyperkeratosis of these sites hardly distinguishable from fissured hyper keratoses from other causes without reference to lesions elsewhere. It may occur in these sites as part of a generalised guttate or nummular psoriasis, forming small coin-sized plaques on the palms and soles which give the impression of infiltration and may be confused with secondary syphilis. The presence of psoriatic lesions elsewhere and the absence of other signs of syphilis should establish the diagnosis.

The development of a *pustular* phase in psoriasis has been stressed in recent years. The phase is uncommon it may be provoked by external irritation (as by chrysarobin) or by internal toxic irritation (as from influenza and tonsillitis), though it sometimes appears spontaneously



FIG. 118. Psoriasis of the hand and nails. (See also Fig 878.)

without obvious cause, usually as part of an acute exacerbation. The palms and soles tend to be particularly affected and present small pin head or larger lakes of sterile pus both in the psoriasis and apart from the psoriatic lesions these lakes heal and leave small brown spots. Similar lakes of pus may be present in patches of psoriasis elsewhere on the body The phase calls for complete rest, a search for septic foci and their removal if found, and mild local treatment. In our opinion this is due to the mingling of an exudative eczematous reaction, often of the pompholyx type, with a psoriatic reaction.

The *nails* are commonly affected in psoriasis. A pin-point pitting of the nails is commonest and is often best seen when the light is reflected from the surface of the nails. This occurs in conditions other than psoriasis, *e.g* skin reactions such as eczema and general disturbances, but its presence with a skin eruption is suggestive of psoriasis. Furrowing and striation of nails and white dystrophic patches are common. Probably

the most important psoriatic change is a general thickening and opacity of the nail plate with an accumulation of white scales on the nail bed (subungual hyperkeratosis) the change being most pronounced distally and tending to lift and evert the nail An important diagnostic point in distinguishing psoriatic nail changes which sometimes occur without much psoriasis elsewhere, from infection and particularly from ringworm of the nails, is that in psoriasis most of the nails tend to be affected on both hands and feet symmetrically whereas infections tend to involve odd nails.

Psoriasis sometimes spontaneously sometimes as the result of irritant treatment, becomes completely generalised involving every portion of the integument in a *generalised exfoliative dermatitis* In this state the distinctive features including the silvery scaling of psoriasis, are lost Like all *generalised exfoliative dermatitis, this may be serious and fatal* though most patients eventually recover Without becoming universal and involving every portion of the integument psoriasis may on occasion spread over wide areas, *e g* the extremities and corset area, losing its characteristics and assuming those of a pityriasis rubra in those sites. When this happens the condition is particularly resistant to treatment

Psoriasis arthropathica The association of a very resistant type of psoriasis with rheumatoid arthritis—*arthropathic psoriasis*—is well recognised It is not particularly amenable to gold therapy as might be expected from the good response of the arthritis to this measure. The psoriasis here tends to be of the acute livid type and calls for mild treatment. The hands and feet are usually involved Rupioid lesions may be present in severe cases and osteo arthritic changes may be marked

Course and prognosis The prognosis varies with the individual. To some extent the family history and past history are relevant the general health is probably more significant and must be considered in relation to *the patient s work and environment*

The prognosis also depends on prompt and efficient treatment of each attack particularly the first, and on after-care Response to treatment and the maintenance of freedom after efficient treatment give some indication of the probable future course, but a troublesome phase during puberty and adolescence does not necessarily mean that the patient will be a lifelong sufferer

After a first attack a patient may remain clear indefinitely and perhaps for life. More commonly relapses occur sooner or later and the course tends to be chronic and relapsing A few patients have the greatest difficulty in remaining free from the eruption for any length of time.

Psoriasis is susceptible to psychological influences and the suggestion that the patient has an incurable affection may materially worsen the course of the disorder On the other hand, a confident and efficient management of the attack *may dismiss serious consideration of its subsequent* behaviour from the patient s mind with beneficial effect.

While attacks are common in spring and autumn psoriasis tends to be better in summer and in warm dry climates and worse in winter and in damp sunless climes Tropical conditions aggravate psoriasis in white subjects and occasionally outbreaks are provoked by ordinary sunlight and by heat.

Diagnosis and differential diagnosis. *In the scalp the diagnosis is readily*

made for psoriasis gives the impression of a miniature mountain range under the fingers.

Psoriasis must be differentiated from seborrhoeic dermatitis and pityriasis rosea and occasionally from dry scaling patchy eczema and from ringworm. Rarely will the distinctive features of silvery scaling, salmon red erythema and the definition and demarcation of the lesions fail to stamp the diagnosis of psoriasis. The other four affections have none of these features. Seborrhoeic affections are most marked on the flexor aspects of limbs, whereas psoriasis affects extensor surfaces and pityriasis rosea is generally confined to the trunk, not affecting the limbs to any degree. In both these affections scaling is slight and pityriasiform (bran-like).

Scaling ringworm lesions of the skin are well defined but are irregularly disposed, rarely affect psoriatic sites (except the scalp) and do not present the heavy silvery scaling of psoriasis.

Patchy squamous eczema has not the silvery scale, and the essential lesions of eczema, including weeping will often be present.

Lichenified circumscribed eczema or lichen simplex chronicus often affects the extensor ulnar borders of the forearms and knees; it may be well defined but is intensely irritating more violaceous than red and has a dull surface and not the scaling of psoriasis

Lichen planus affecting psoriatic sites may suggest psoriasis. If there is no lesion on the buccal mucosa, the colour the itching, the burnished appearance in reflec ed light and particularly the infiltration of the lichen papule will usually indicate the diagnosis, but the distinction may be difficult.

Both secondary and tertiary syphilis may provoke psoriasiform lesions. In secondary syphilis a sore throat, the presence of lesions on mucous membranes, general adenitis and the absence of itching should be noted. The eruption will be polymorphic in most cases, but the essential feature is the infiltration of the syphilitic papule. The Wassermann reaction of the blood is positive In tertiary syphilis differentiation may not be so easy Both tertiary syphilis and psoriasis tend to form circinate lesions, but in the former it is usually a solitary unilateral lesion, which is infil trated and tends to ulceration and scarring A Wassermann reaction will confirm a suspicion of tertiary syphilis in 90 per cent. of cases and the response to therapy will quickly remove any doubts. Reference should be made to the rare disease, pityriasis rubra pilaris, which may closely resemble psoriasis.

Treatment. While certain guiding principles in treatment may be helpful it must be recognised that every case of psoriasis is an individual problem.

Psoriasis is not a disabling disease though it may be most demoralising The physician should not, therefore, burden the patient with treatment more troublesome than the disease unless it is to good purpose. Having apprised the patient of the facts as he sees them it is for the intelligent patient to determine the course of action, but he should bear certain facts in mind, as the following:

The eruption can generally be cleared in hospital, in two or three weeks. Clearance gives a period of freedom which may be long or short.

Neglected psoriasis may be a burden and annoyance to others besides the patient.

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Diagnosis and differential diagnosis. In the scalp the diagnosis is readily

Other forms of tar may be used as birch tar (ol. rusci) or juniper tar (ol. cadi) the latter being particularly good for the scalp. Less effective are the cleaner forms of tar e.g., liq. picis carb., as in the following prescriptions or the proprietary ether soluble tar pastes (Martindale) or tars dissolved in spirituous solutions.

℞ Acid. salicyl, gr 10.	℞ Acid. salicyl., gr 10
Liq. picis. carb., m. 30	Ol. cadi., dr 1
Hydrarg ammon., gr 10	Halden's emulsifying base gr 120.
Paraff. moll. ad oz. 1	Paraff moll., ad oz. 1
Ft. ung.	Ft. ung

Salicylic acid is generally added to these ointments, chiefly because of its value in removing scale mercury is also of value as a local application. The prescribing of these drugs in an emulsifying base or the addition of such base to the ointment (e.g. Halden's emulsifying base 25 per cent) is a great asset, especially in treating the scalp, because it makes it easy to wash the ointment out of the skin or hair

Tar is also used in the form of tar baths (Liq picis, carb., oz. 4 to a 20-gallon bath) which can with advantage be followed by exposure to the ultra violet lamp.

Equal parts of liq picis carb. and water are useful as a wash for the scalp, or as a prophylactic after psoriasis has been cleared with oil of cade ointment.

Dithranol (B.P) or the proprietary equivalents, Derobin (Glaxo) and Cignolin (Bayer), is the modern synthetic equivalent of chrysarobin. It has the advantage that it does not rot linen, though it stains it lilac It does not stain the hair or seriously inflame flexures or the conjunctiva unless used carelessly

The oxidising or burning qualities of dithranol are greatly enhanced if mixed with mercury tar or salicylic acid, but in an ointment *the value of* the dithranol may in this way be rapidly destroyed. If required they should be prescribed separately and mixed immediately before use. Though the activity is still enhanced the dithranol is not, however destroyed if prescribed (gr 2 to 1 oz.) with salicylic acid in Lassar's paste

Such an application rapidly removes psoriasis by burning it off It should be applied exactly to the affected parts and covered. The treatment is best conducted in hospital. This measure also can be combined with tar baths and ultra-violet light and is rapidly effective.

Measures suitable for treatment of psoriasis of the scalp have been indicated. In addition the regular weekly use of a good spirit or oil or tar shampoo is desirable

X ray therapy is rarely employed in the treatment of chronic psoriasis though it may be of value in treatment of the nails and in some cases where the flexures are involved and when localised lesions are resistant.

Grenz-ray therapy is not as effective as X rays.

After-care. Regular toilet care of the skin and especially of the scalp is important. The use of a pomade with a little mercury and tar and salicylic acid, or of a wash with tar may be beneficial.

Many patients make an exposure to the ultra-violet lamp a part of the daily toilet routine and reduce their susceptibility to attacks. Others benefit from phenobarbitone, gr ½ daily over long periods

The neglect of psoriasis generally leads to its aggravation and *to a worsened prognosis if only for psychological reasons.*

On the other hand a period of difficulty in the management of a case as at puberty or at the menopause—does not necessarily mean absolute chronicity and severity

Most psoriatics find that certain climatic conditions—often warmth and sun—are beneficial

Certain employments *e g* mining and those carrying much psychological strain, are detrimental

A period of investigation and observation under treatment may help the physician to assess what measures, if any are likely to reduce the susceptibility of a particular patient to relapses.

Psychological factors ultimately play a part in the course of psoriasis *in a majority of patients and depression hinders progress.*

These matters are for the general consideration of the patient

From the medical point of view we may say from experience that attention should be given to the general and mental health and any faults should be corrected special attention being directed to the possibilities of focal sepsis, of hormonal imbalance and of nervous instability

There is no specific drug or internal medication of value in *all* cases of psoriasis though there are often indications for symptomatic therapy

In general acute and extensive cases are helped by a course of salicylates and alkalies. It is not surprising that some such cases are improved by sulphonamides since they may be provoked by upper respiratory or other acute infections.

Chronic and intractable cases may be improved by a course of metallic injections as arsenic or mercury or manganese. Mercuric-salicyl arsonate gr ½ to gr 1 or mercolloid (mercuric sulphide) 1 c.c. intramuscularly weekly may be given for a course of ten injections Shock therapy—T.A B vaccine—is also of value. In general, chronic cases are often *helped by sedative-tonic measures as fractional doses of phenobarbitone* At puberty and the menopause thyroid and hormonal therapy may be indicated

Local treatment is of first importance and should be conducted efficiently preferably in hospital or in a dermatological department.

The essential of local treatment is probably a process of oxidation or burning and in this tar dithranol and ultra violet light are measures of proven value The production of an active erythema is also a factor

Crude coal tar or Stockholm tar may be painted on the skin and allowed to dry in (Danish method) Or it may be incorporated in an ointment which may *be used alone after a bath, or may be used in conjunction with* ultra violet light (Goeckermann's treatment) In this the following ointment is applied at night after a bath this is cleaned off with oil in the morning and the patient is then exposed to the ultra violet lamp, a mild erythema being produced —

℞ Acid salicyl gr 10
Pic. carb prep gr 20
Zinc. oxid. gr 120
Paraff moll ad oz. 1
Ft. ung

PLATE 21



PUSTULAR PSORIASIS

Man aged 53. Forty years history of psoriasis growth on knees and elbows.

[To face p. 22]

Pustular psoriasis Some cases of very acute psoriasis or psoriasis which has been aggravated by treatment may show small scattered sterile pin-head lakes of pus It is probable that in these cases an increased exudation converts the dry abscesses of Munro into fluid abscesses and the change is most readily observed in the palms and soles. Attention was first drawn to this feature by Barber and Ingram, who suggested that other cases of chronic pustular eruption of this type occurring in the palms and soles in the absence of ordinary psoriasis, might be cases of pustular psoriasis. Dore had described such cases as a benign form of acrodermatitis perstans of Hallopeau Recently Clinton Andrews has shown that a number of these cases are dependent upon tonsillar sepsis and are cured by removal



FIG 114 Psoriasis with pustular lesions.

of the focus He terms the condition pustular bacteride regarding the eruption as an allergic one (Plate 21)

Similar eruptions are seen *associated with ringworm infection of the* toes and are recognised as epidermophytide manifestations.

A good deal of confusion exists at present but it is probable that the entity of chronic pustular eruption of palms and soles or "persistent pustular pompholyx may arise from a variety of causes When associated with and a part of a psoriasis eruption search for foci of sepsis should be made and local treatment should be mild, since severe reactions may occur (see p 233) If at all acute these cases demand rest in bed and careful general overhaul and treatment.

Keratodermia blenorrhagica

(Gk. *κέρας-ατος* horn *βλέννος* mucus)

A symmetrical eruption of wax like rupioid psoriasiform lesions usually *associated with arthritis of gonorrhœal type* This very rare condition was first described by Vidal A few instances have been recorded in France The first case recognised in this country was reported by Sequeira in 1910 (Plate 22)

The patient was under the care of Dr F J Smith, suffering from gonorrhœal arthritis and periarthritis of the right knee right elbow and right sterno-clavicular articulation The left knee was also slightly affected The man was in a very cachectic condition anæmic and wasted. The urethral discharge had ceased after a few days treatment with sandal wood oil before the *patient was admitted to hospital* The cutaneous condition was remarkable. Along the inner border of each foot was an irregular horny *mass* with a nodular surface Smaller masses were present

PLATE 22



KERATODERMIA BLENORRHAGICA

[To face p. 230.

along the outer side of each sole, and the intervening areas were covered with yellowish brown parchment-like thickening of the epidermis. The nodules were of a dark brown or purple-brown colour aptly likened to aloes embedded in the skin. The individual swellings measured 0·3 to 2 centimetres across. The masses as a whole closely resembled a mountain range on a relief map a description which has been given by French authors. Although most developed on the soles, the excrescences crept towards the dorsum of the foot on both inner and outer aspects. The area affected was sharply defined by a narrow zone of hyperæmia. With the exception of small nodules at the base of the great toe, the digits were free The lesions felt like horn, and no fluid could be withdrawn on puncture.

The nodules were covered with a thick horny cap, and the stratum granulosum and Malpighian layers were infiltrated with neutrophile leucocytes. There was also some œdema of the papillary layer with lymphocytic infiltration and plasma cells about the vessels. It may be remarked that the histological picture resembles that of pustular psoriasis.

Under treatment by gonococcus vaccine the arthritic lesions subsided and the carapace on the soles peeled off in large masses, leaving reddish brown stains, the whole duration of the keratodermia being about three months. This appears to be the usual course. In some instances the palms are also affected, but usually to a less extent than the soles. The disease is usually met with in grave gonococcal infection with severe arthritis and general symptoms. Jacquet described a case in which three successive attacks of gonorrhœa were followed by keratodermia and articular disease. Lesions of similar type have been seen rarely in patients with severe acute rheumatoid arthritis in whom there has been no evidence of gonococcal infection The eruption may be widespread and pustular

Parapsoriasis

Under this name are included three types of chronic psoriasiform and lichenoid eruptions. Nothing is known as to their causation and the name must not be regarded as indicating any relationship to psoriasis. Their essential features are eruptions of various types but always erythemato-squamous; they are persistent and may last throughout life and are highly resistant to treatment. The parapsoriases are very rare and generally appear first in early adult life.

Pathology Vaso-dilatation, œdema and some lymphocytic infiltration of the dermis are present, and these are associated with parakeratosis and œdema of the epidermis.

Clinical features. (1) *Parapsoriasis en gouttes* (Brocq) Pityriasis lichenoides chronica. The eruption involves the trunk and limbs. The individual lesions are macules up to a centimetre in diameter often covered with a fine adherent scale. They may become confluent and vary when observed over long periods.

Pityriasis lichenoides chronica presents an eruption of small maculo-papules, many having a central scale readily detached entire by the finger nail leaving a red flat surface It may be a separate entity The eruptions recur at intervals and in very rare instances there may be hæmorrhage and necrosis with the formation of scars resembling small pox. Such lesions suggest a papulo-necrotic tuberculide and may also be apparent

in a type of the eruption which has been described as *pityriasis lichenoides et varioliformis acuta*. In this variety in addition to the small scaling erythematous spots there are papules (2 to 5 mm diam.) which may be capped by vesicles and commonly undergo necrosis leaving varioliform scars. The trunk and limbs are affected and the eruption which is most often seen in children may occur at any age. This acute type may run a definite course with mild fever and closely simulate varicella.

(2) *Parapsoriasis en Plaques* (Brocq). Here the eruption takes the form of yellowish red patches of discoloration rounded or irregular in shape and covered with a fine scaling. The lesions vary in size from a finger print to a hand and they affect the trunk and proximal parts of the limbs. (To this type Radcliffe Crocker gave the name *Xantho-erythrodermia perstans*.) Occasionally the colour may be bluish or grey and the eruption may have a coarse reticular pattern. The lesions may be macular or thickened like psoriasis. Milian Civatte and Ingram have seen this type develop mycosis fungoides tumours with gross enlargement of isolated lymphatic glands.

(3) *Parapsoriasis lichenoide* (Brocq). *Parakeratosis variegata* (Unna *et al.*). *Lichen variegatus* (Crocker). Here the eruption consists of a yellowish red lichenoid network particularly affecting the extremities but also involving the trunk. The lesions are often capped with a fine scale but the meshes of the network are of normal skin. This type has also been seen to pass on to mycosis fungoides.

Prognosis. The characters of the eruption may be constant for years or may undergo variations parts clearing up entirely independently of treatment. Except in the types indicated there is no atrophy.

Diagnosis. Parapsoriasis may closely simulate psoriasis, and may not be suspected until its resistance to treatment becomes obvious. The scalp however is not affected in parapsoriasis, the scales are not so silvery and the removal of the scale does not disclose the characteristic membrane of psoriasis. Lichen planus is excluded by the absence of itching and of mucous membrane lesions and its characteristic lilac or violaceous colour. Secondary syphilis is excluded by the absence of infiltration in the lesions involvement of the mucous membranes and general adenitis. Some seborrhoides may be simulated by the plaque-like eruption but the resistance to treatment is characteristic of parapsoriasis. It is possible that some types are premycosic and this possibility must be borne in mind.

Treatment of Parapsoriasis. The only measure which has had a degree of success and in some cases cure is the application of Thor um X in a collodion base (1 000 e.s u per c.c.). This is painted on the affected areas and allowed to dry. The patches gradually fade and disappear. If extensive areas are treated there may be a temporary malaise.

'**Dermatitis colonica**' (Whitfield) is a persistent eruption on th thighs and legs resembling parapsoriasis, apparently due to the presence of streptococci in the bowel and a considerable reduction or absence of *B coli*. The correction of this abnormal flora may clear the eruption, but the clinical appearance is not unlike "crazy pavement" skin (Figs. 41 and 42) and vitamin therapy may be effective.

CHAPTER XIII

TOXIC ERUPTIONS INCLUDING THE ERYTHEMATA

Erythema Multiforme Erythema Nodosum Granuloma Annulare
Lupus Erythematosus Urticaria Purpura, Schamberg's Disease
Poikiloderma

ERYTHEMA

Definition. Erythema simply means redness of the skin, the word being derived from the Greek word for a blush, and the term may be used for any lesion of the skin showing hyperæmia, with or without œdema and infiltration. Being due to dilatation of vessels, the redness disappears on compression thus differing from purpura, and since redness is one of the cardinal features of inflammation, erythema is an early and constant sign of dermatitis or of any inflammatory reaction involving the skin. Dilatation of the capillaries due to vasomotor disturbances produces erythema without inflammation.

Method of Production. According to Lewis, the vasodilatation resulting from local tissue damage is due to the action of "H" substance, a metabolite produced on the spot, and it is thought that circulating toxins usually act indirectly upon the vessels by the local production of this substance. Further recent work suggests that active vascular dilatation through nerve stimulation also occurs by chemical means, the ultimate stimulus presumably being "H" substance again. That erythema (active capillary dilatation) can be of nervous origin is certain, *e.g.*, the emotional blush and the flushed face of a patient with rosacea after a hot drink, and Stricker in 1876 was able to produce erythema of the skin of the limbs by stimulating the cut end of a posterior root of a spinal nerve.

Essential causes of erythema. These fall into three main groups:—

(1) Noxious agents of physical, chemical or biological nature affecting the skin from without or from within.

(2) Idiopathic causes, presumably toxic, metabolic hormonal or of obscure origin, *e.g.* erythema here in renal œdema (p. 97)

(3) Nervous causes functional or organic.

Classification The erythemata have been classified as primary or secondary idiopathic or symptomatic, the secondary or symptomatic varieties being manifestations of specific fevers, infections or constitutional disturbances. In spite of the fact that the etiology of some erythemata is obscure it is most helpful to consider the subject on an etiological basis since that is essential in treatment. There are localised and generalised varieties. As a rule, localised asymmetrical erythema is due to infection or to injury from *without* and the symmetrical and generalised eruptions are due to causes acting from within. Because erythema is the earliest visible sign of reaction to external irritation its origin from this cause is generally obvious.

GROUP I. Erythema due to external causes

(1) Mechanical. Erythema traumaticum. Page 291
(2) *Heat.*

Erythema ab igne Page 306.

(3) *Cold*

Frost bite Page 301
Livedo reticularis Page 301
Erythema pernio Page 303
Acrocyanosis Page 303
Erythrocyanosis cruris. Page 303

(4) *Ultra violet light*

Erythema solare Page 308

(5) *Radiodermatitis* Page 315

(6) *Chemical dermatitis* Page 319

(7) *Biological*

Animals, insects plants bacteria etc

GROUP II Erythema due to internal causes

(1) *Infections*

General infections Erythema occurs in a number of general infections and is here regarded as symptomatic. The erythema may be local or general and as in many conditions the presence of the infecting agent has not been demonstrated in the skin lesions it is probable that many such eruptions are toxic in origin This group therefore makes a useful introduction to the study of the erythemata of obscure origin and many analogies will be observed As the cause whether toxic or infective, comes from within the resulting lesions are likely to be symmetrical but it must be remembered that areas of skin exposed to cold heat, light or any form of irritation may be more reactive and produce anomalous patchy or asymmetrical eruptions Similarly since the erythematous response depends upon intact vascular and nervous mechanisms lesions of vessels or nerves may account for a perplexing picture. These observations apply to all erythematous eruptions however produced

Localised erythema or small erythematous macules occur in the following systemic infections with viruses, bacteria or protozoa Cerebrospinal meningitis typhoid, chicken pox small pox, dengue leprosy malaria, syphilis and tuberculosis amongst numerous others.

Generalised erythema or erythema in sheets occurs in scarlet fever measles German measles and more rarely in acute rheumatism. Many of the above conditions may be recognised by characteristic lesions which develop quickly from the initial erythematous macule but scarlet fever is closely imitated by a number of widely spread erythemata of drug or presumably of toxic origin. See erythema scarlatiniforme (p 249)

(2) *Toxins*

Toxic erythema from drugs foods and intestinal toxaemia. A list of the common drugs causing erythema is given on page 288 and the view is expressed that many if not all of the eruptions are not due to the drug itself but probably to some secondary toxic cellular product, and this explains why many drug eruptions have exact counterparts in certain toxic rashes For instance, in cases of arsenical dermatitis the first lesions may appear on the flexor aspects of the forearms as erythematous macules which irritate. The erythematous rash spreads symmetrically on the arms and then affects the face and neck and later may involve the trunk and lower

limbs. In severe cases the erythema becomes universal and shows a tendency to desquamate early which helps to distinguish the condition from scarlet fever (*vide* secondary erythrodermia, p. 275).

Another less serious eruption sometimes arises on the ninth or tenth day after the first injection of arsenic in the treatment of syphilis. Milian called it "*Erythema of the ninth day*" and it appears as a rapidly spreading scarlatiniform or morbilliform eruption with little irritation. The rash lasts but a few days there is no desquamation and it does not recur with further arsenical treatment.

The sites affected by the arsenical eruption are often those of other toxic rashes which also may involve the trunk, upper arms and thighs instead. Erythematous toxic eruptions present a variety of lesions from the large sheets of scarlatiniform type through smaller macular lesions of different size and shape to minute pin-head spots. Sometimes the eruptions are slightly oedematous and might reasonably be regarded as urticaria, but this distinction between toxic rashes is of no practical importance. Toxic rashes usually erupt quickly and begin to fade in a few days, leaving brownish macular staining and slight desquamation as a rule. Some irritation is usually present and may precede the eruption, and since the skin reaction is but a manifestation of a general intoxication there may be malaise vomiting, diarrhoea, slight fever and joint pains.

Apart from drug eruptions and the rashes associated with general infections already mentioned the following are common causes of *toxic* rashes —

(1) Certain *foods* such as shell-fish, mushrooms, tinned meat or fish and acid fruits, e.g., strawberries and plums, etc. Small seasonal epidemics of toxic eruptions occur when certain foods are plentiful and diagnosis becomes increasingly easy

(2) *Intestinal toxaemia* cannot be disputed when a rash follows vomiting diarrhoea or both and the well-known enema rash is ascribed to increased absorption of toxic faecal products. So in the absence of other causative factors one often has to assume that the toxin is an alimentary one and successful treatment with aperients, antiseptics and absorbents (charcoal and kaolin) seems to justify this assumption. *Hydatid* or tapeworm infection may also account for a toxic erythema.

Certain types of toxic erythema exhibit peculiar features, and upon these special clinical varieties have been established. The two best known are erythema multiforme and erythema nodosum.

Erythema multiforme. Erythema exudativum. (Erytheme polymorphe)

A toxic eruption characterised by erythematous patches of various shapes patterns and sizes accompanied by serous exudate producing elevated lesions and frequently vesicles and bullae.

Etiology Erythema multiforme is most common in children and adolescents and shows a seasonal incidence in spring and autumn The causes are those already enumerated for toxic eruptions but *E. multiforme* is rarely due to foods and drugs but to bacteria and their toxins and antitoxins. Some regard it as evidence of a rheumatic infection because

it is at times associated with acute rheumatism and at other times with arthritis endocarditis chorea and tonsillitis but its etiological basis is obviously broader than that. Not infrequently the eruption appears without symptoms in a healthy subject and no cause can be found.

Pathology The essential changes may be explained by the action of circulating toxins upon the small vessels or upon the nerves controlling them resulting in dilatation and exudation of plasma the latter causing œdema of the prickle-cell layer and forming vesicles or blebs at various levels in the epidermis. A cellular infiltration is most marked about the dilated vessels and may reach the deepest layers of the corium and also invade the epidermis making the vesicles and blebs cloudy and purulent Erythrocytes may escape from the vessels and colour the lesions.

Clinical features *General* Sometimes the eruption appears without any general disturbance but usually the onset is marked by malaise and a slight degree of fever Pain and swelling of the larger joints may occur also sore throat vomiting and diarrhœa but the more severe constitutional symptoms often denote the presence of some definite infectious disease.

Local The eruption usually appears suddenly and is symmetrical It commonly affects the dorsal surfaces of the hands and feet the extensor surfaces of the arms and legs, the knuckles, wrists and knees and at times the face and neck Other parts may be involved and not infrequently the mucous membranes of the lips, tongue cheeks conjunctivæ, prepuce and pharynx show red macules papules, vesicles and superficial erosions.

The simplest lesions are dark red macules, round or oval and sharply defined Exudation produces papules or raised plaques and vesicles or bullæ may arise later Although all these forms are often found together usually one type of lesion predominates and this accounts for a number of names which are merely descriptive.

Erythema papulatum refers to a variety presenting dome-shaped papules about 0·5 cm in diameter Larger nodular forms occur and have been described as E tuberculatum or E tuberculosum confusing terms best avoided.

Erythema circinatum describes ringed lesions, having a pale centre and a red margin which may be narrow vivid and raised presenting a striking appearance The coalescence of two or more rings produces gyrate patterns termed E. figuratum

Erythema iris (Gk *iris*—rainbow) is a variety characterised by concentric vari-coloured rings resembling a target (Plate 23) The centre varies in colour from rose pink to purple and may be vesicular or hæmorrhagic. Around this occur two or more zones alternately dark or pale The usual size is between ½ to 3 cm. This variety is perhaps the best known because recurrences are quite common and may be frequent *Erythema vesiculosum* and *E bullosum* are self-descriptive *Erythema purpuricum* is a more severe toxæmia in which hæmorrhages occur into the erythematous spots or central blebs and one of Sequeira s patients had hæmaturia at the same time *E herpes iris* has a peripheral ring of vesicles.

Course and prognosis. The disease runs an acute course of one to four weeks and leaves no trace on the skin although some desquamation or pigmentation may persist temporarily Recurrence may occur particularly in the iris type sometimes for ten to fifteen years



ERYTHEMA IRIS.

The patient (female, aged 20) had had eight attacks in two years. There were vesico-bullous lesions in the mouth.

[To face p. 2[illegible]

Diagnosis. This is not difficult as a rule, for the slight prodromal symptoms and the sudden appearance of the circumscribed red patches on the extremities with little irritation are very suggestive. Soon the variations in the pattern and colour tones of the lesions make the multiform character obvious.

Acute lupus erythematosus may simulate very closely the red macular type, but the former eruption most commonly affects the central part of the face and the fingers, the lesions are dull, scaly purplish and uniform in type and are very persistent (page 255). Urticaria resembles the papular and œdematous types which histologically are urticarial reactions, but nettle-rash is common enough to be well known its lesions are very uniform, transitory less erythematous and more irritating (page 237).



Fig. 115. Erythema bullosum.

Tinea circinata is differentiated from the circinate and annular erythemata by its scaly edge which is made up of vesicles and pustules and so rarely has a uniform smooth rounded edge. In cases of doubt microscopical examination of scrapings of the edge for the presence of fungus should be made (page 893).

Dermatitis herpetiformis and pemphigus may be closely imitated by the bullous varieties of E. multiforme but as these are very chronic conditions as a rule, time eliminates doubt (page 643).

Treatment. The first essential is to consider every possible cause and by careful enquiry and examination to eliminate a food, drug or inflammatory origin. When associated with bacterial or protozoal infections general treatment is merely for those, *e.g.*, quinine for malaria, and in rheumatic conditions aspirin and salicylates. In cases of obscure etiology or if gastro-intestinal symptoms are present, alkalies, aperients, intestinal antiseptics and adsorbents should be tried and a protein free diet, *e.g.*, mist. alba; hydrarg cum cret., gr i., t.d.s.; and medicinal kaolin or charcoal. Warm alkaline baths are helpful.

Local treatment consists of the application of cooling and sedative lotions such as calamine with liq plumbi subacet. fort. ♏v to an ounce or liq picis carb. ♏x, glycerine ♏xxx to one ounce of liq plumbi subacet. dil.

Chronic forms of erythema. A number of chronic eruptions closely

resembling the circinate forms of erythema multiforme appear to have received different names from different observers.

Erythema annulare centrifugum of Darier is usually seen as large rings with smooth, pink, cord like edges which slowly move in a centrifugal manner and occasionally one can observe the lesions evolve from a papule which resolves in the centre and spreads peripherally. The eruption may last six months or more. *Erythema chronica migrans* is a similar ringed eruption with a larger pattern, but as some of these cases have been sequelæ to insect bites they may be infections of the skin.

Erythema figuratum perstans or erythema gyratum perstans refers to very similar conditions but usually the edges of the lesions are broader and flatter and the lesions themselves more numerous.

Granuloma annulare (page 247) is probably allied to these chronic ringed eruptions although its edge is more papular like the lesions of *erythema elevatum diutinum* of Radcliffe Crocker and Campbell Williams (page 249).

In general it is thought that all these eruptions are of toxic origin having the same etiological factors as erythema multiforme, but their response to treatment is much less satisfactory. Whether these conditions are clinical entities is still a matter of controversy in dermatological circles.

Erythema nodosum

This may be defined as a toxic eruption characterised by the formation of symmetrical nodular erythematous swellings on the shins or extensor aspects of the limbs.

Etiology. It is thought by many to be a variety of erythema multiforme but this is anomalous since the lesions are of a solitary and constant type and clearly represent a pattern of allergic reaction to organisms *in situ* or to drugs or toxins carried by the blood stream. There are many recent references in the literature to its association with tuberculosis and some authorities regard it as essentially a tuberculous manifestation. Goldsmith reviews the evidence and concludes that although a tuberculous infection gives rise to erythema nodosum the eruption is not essentially a tuberculous manifestation. Similar eruptions, in fact, are seen in acute fevers and especially with streptococcal and meningococcal infections and have followed the ingestion of drugs, notably iodide, bromide and antipyrin. Moreover Sequeira reported that 20 per cent. of his cases of *E. nodosum* were associated with rheumatic fever so that the only common factor in these associations is a toxic one and a specific infective cause is improbable. Like E. multiforme the disease is more frequent in the spring and autumn; females between ten and thirty are most commonly affected. Lendon looked upon *E. nodosum* as an acute specific disease and coined the name "nodal fever" to describe it.

Pathology. This is essentially similar to that of E. multiforme but the whole thickness of the skin and subcutaneous tissues are involved. Cellular infiltration and exudation are more marked and red blood cells or actual hæmorrhages are frequently present. The latter account for the staining which is apt to mark the site of resolved lesions.

PLATE 24



Erythema Nodosum.
Both legs were affected.

PLATE 25

GRANULOMA ANNULARE

[To face p. 47

Clinical picture. *General* The onset of the eruption is preceded by malaise, gastro-intestinal disturbances, fever and joint pains of rheumatic type. These symptoms may be slight or severe with hyperpyrexia, rigors and delirium which are fortunately rare

Local. The eruption is symmetrical and appears abruptly most often about the middle of the shins, occasionally below the elbows and rarely on the thighs, upper arms and face. The skin lesions are acute inflammations, being red, swollen, hot, painful and very tender to touch they are oval or round, slightly dome-shaped with a tense shiny surface. Evolution is rapid and in twelve to twenty four hours the colour may be fading and the tenseness gone, but the node can be seen and felt for a week or more and some staining and slight desquamation mark the site for several weeks. New crops may appear and prolong the disease. Ulceration never occurs and eventually nothing remains to bear witness to the attack. Recurrences are rare (Plate 24)

A noteworthy feature of the erythema nodosum of meningococcal origin is the profuse character of the eruption, its involvement of both arms and legs and often of other parts of the body as well. The individual lesions are small but otherwise identical with the common type. The organism can be recovered from the nodes. The eruption responds immediately to sulphonamide therapy

Diagnosis. This is easy as a rule. The symmetry rules out acute local infection such as erysipelas, cellulitis or abscess and at the same time the acute inflammation marks it from the granulomata. Erythema induratum, *q.v* is chronic, relatively painless and often ulcerated. Evidence of tuberculosis should be sought.

Treatment. Complete rest is essential with the diet and nursing of a fever Quinine, asperin, salicin and alkalies may be found useful. Blood cultures should be taken during pyrexial phases and penicillin or sulphonamides given in adequate doses if indicated, and we have seen dramatic recovery follow their use. Local measures are limited to the application of cooling lotions, such as lotio plumbi or aluminium acetate 2 per cent.

Granuloma annulare

An eruption occurring on the extremities and occasionally elsewhere, characterised by small papules arranged in rings, which after running an indolent course disappear spontaneously (Plate 25).

Etiology The patients are usually children or young adults The cause is unknown, but the reaction is probably a toxic or allergic one and the lesions are obviously related clinically to the chronic circinate erythema group including erythema centrifugum and erythema elevatum diutinum.

Pathology The characteristic changes are in the middle layers of the cutis where nodular areas of coagulation necrosis, surrounded by a peripheral wall of infiltrate consisting of epithelioid cells and lymphocytes occur These cells are thickest near the area of necrosis. The collections of epithelioid cells are either separated by radial strands of collagenous fibres or lie embedded in them The elastic tissue has vanished in the affected areas. Changes in the blood vessels are slight.

The epidermis shows hypertrophy of the Malphigian layer with numer

ous mitoses and some œdema and parakeratosis. Similar features are seen in the nodules of rheumatoid arthritis and in other allergic lesions. (Collins 1037.)

Clinical appearances The eruption consists of skin-coloured papules and is particularly distributed over the backs of the fingers and hands toes and feet, and the extensor surfaces of the elbows and knees. It occurs sometimes on the thighs, buttocks, breasts or face indeed, in all the sites of the toxic erythemas Sometimes there is a lilac hue about the margins of the papules or rings and the skin within the rings may give the appearance of slight atrophy though actual atrophy does not seem to occur These superficial lesions are obviously in part dependent for their characters upon the œdema associated with the



Fig 110 Granuloma annulare

reaction and sometimes rest in bed will cause a considerable collapse of the œdema shown by a gutter round the summit of a ringed lesion after such rest The ringed lesions are sometimes associated with infiltration in the deeper dermis or subcutaneous tissue but not involving the epidermis and they may thus simulate a sarcoid or tuberculous type of infiltration.

The clinical appearances may last from a few months to twenty or thirty years and variations occur disappearance and re-appearance depend upon the patient s general health Although the condition is most common in children and young adults, it may occur at any age and one of our patients in her seventh decade developed a large lesion across the front of the neck and a biopsy established the diagnosis.

Diagnosis. The *lesions of granuloma annulare are* usually mistaken for tinea circinata by those unfamiliar with the characteristic features. The scaly vesicular or pustular edge of ringworm is quite unlike the

smooth, unbroken and often uninflamed skin which appears to overlie the pseudo-cartilaginous ring of granuloma annulare. In fact, the lesions of the latter are so characteristic that once seen they are rarely forgotten. Some of the chronic circinate or annular localised erythemata may closely resemble granuloma annulare, but since the conditions are probably related the distinction is of no practical importance. Occasionally sarcoids present a similar raised pattern, but the colour tones are deeper in red and brown. We have seen a case of granuloma annulare which was thought to be cutaneous Leishmaniasis and was investigated by pathologists in Egypt and London before being sent to a dermatologist who recognised the familiar lesions at once.

Treatment. There is no specific treatment for granuloma annulare but any underlying cause of toxaemia should be sought, though none may be found. Treatment is essentially symptomatic and should be directed towards raising the patient's resistance to infection. Locally fractional doses of X rays (50 to 100 r) or occlusive dressings, such as elastoplast cause a temporary or permanent disappearance of the eruption.

Erythema elevatum diutinum. Several cases have been recorded of an interesting and rare eruption of raised persistent nodules, beginning sometimes about the knees, and extending to the elbows and buttocks, and finally to the hands. The lesions are convex, raised, well-defined, smooth, purplish red and tender. They usually have a circular or oval outline, and are somewhat symmetrically arranged. Itching and tingling of the spots have been recorded. Histologically the eruption is a chronic inflammation of the dermis about the sweat glands, the corium being the seat of a fibro-cellular infiltration. The nature and relationships of the condition are unknown, but the condition may well be a deeper coloured variant of granuloma annulare and no disadvantage is likely to accrue if it is regarded as such.

Erythema scarlatiniforme. When discussing the types of toxic erythemata mention was made of patchy scarlatiniform *eruptions* but this variety is regarded as a clinical entity and bridges the gap to the so-called erythrodermas. As the name infers this eruption closely resembles that of scarlet fever.

Etiology. The cause is often obscure but may include those causes mentioned for the toxic eruptions, interesting examples being quinine by mouth, mercury by inunction, iodoform by local application, various infections and even enemata.

Clinical features. Constitutional effects depend upon the essential cause; if this is an infection malaise and moderate fever usually precede the eruption by a day or two but in other cases the eruption is the first sign. It is sufficient to say that the rash is often indistinguishable from that of scarlet fever but less extensive. Desquamation appears early by the second day in some instances. Subacute and recurrent varieties occur and sometimes the scaling is gross, casts of the hands and feet being shed and rarely the nails and hair too.

The course is short, the rash disappearing in twenty four hours or lasting up to a week and sometimes continuing as an exfoliative dermatitis. If recurrent subsequent attacks tend to be less severe.

Barber and others have put forward the view that lupus erythematosus is caused by focal infection with hæmolytic streptococci the foci being at the roots of the teeth in the tonsillar crypts nasal sinuses the prostate or intestine However it is unusual to find that the removal of such a focus cures lupus erythematosus

The obscurity of its cause and the partial or complete lack of resistance to infection and toxæmia suggests some profound deficiency possibly in relation to a defective response of the reticulo-endothelial system



Fig 110 Lupus erythematosus. Buccal mucosa and lips affected.

The lesions may be allergic reactions dependent upon various factors relating to infection and immunity

Ultra violet light is a potent factor exposure to sunlight nearly always aggravates and sunburn may initiate the eruption of lupus erythematosus We have seen an extensive actinic dermatitis of the whole face V of neck and both arms replaced by lupus erythematosus in a young woman

Pathology Lupus erythematosus is a peculiar form of inflammation of the skin beginning in the vascular layer about the sebaceous and sweat glands, and sometimes around the follicular orifices There is hyperæmia of the corium and later cellular infiltration about the vessels The

PLATE 20



LUPUS ERYTHEMATOSUS.

Duration seven years. The butterfly patches are characteristic. Their centres are atrophic and the margins scaly. Recently the disease has appeared on the trunk and extremities.

infiltration consists of round cells, mast cells, and plasma cells, and occasionally giant cells have been observed. Finally the infiltration undergoes cicatricial changes leading to destruction of the glandular elements of the skin, including the hair follicles. The tubercle bacillus has not been found in the tissue.

Clinical features. The lesions are erythematous and follicular The former consist of flat red spots of various sizes with a dry and smooth or a scaly surface. There is sometimes some elevation above the level of the surrounding skin. In the follicular type there is hyperæmia at the margins of the patch, the centre of which is covered with an adherent scale, which finally may become of a greyish or yellowish colour This scale is difficult to detach, and when removed a surface is exposed in which the dilated orifices of the glands are easily seen. On the under surface of the scale there are conical plugs which occupied the dilated gland orifices. Adjacent to the lesions small groups of follicles often show coarse, yellowish plugs which are of diagnostic value. In very rare instances the lesions may be nodular (Radcliffe-Crocker). The patch tends to extend at the margin and to heal in the centre, leaving a slightly depressed scar The progress of the disease is always slow and it may persist for years. Occasionally the inflammatory process clears up spontaneously and if of the superficial type may leave very little cicatrix (Plate 26).

The seat of election is the face usually the cheeks and the bridge of the nose where the lesions form a butterfly patch (Fig 118) The eruption commonly starts as isolated symmetrical patches on the cheeks, but sometimes begins on the nose and spreads outwards from it. It frequently attacks the scalp, the patches at first being red and scaly and ultimately areas of smooth scar devoid of hair and surrounded by a narrow margin of redness covered with adherent scale In rare instances the scalp is attacked first. The auricles are frequently affected, and the cicatricial contraction may lead to considerable deformity The backs of the hands and the fingers are also commonly involved, the lesions closely resembling chilblains, but they do not clear up in the warm weather Exceptionally lesions of the common type occur on the trunk, the most frequent site being the shoulders and the limbs. Such cases are sufficiently common to be classed as chronic disseminated lupus erythematosus. In most cases the eruption is worse in the winter and spring but this is not always the case.

The appearances vary somewhat in different types. In some there is excessive formation of scale, and massive crusts develop; in others the scaling is confined to a narrow ring round the *slowly-spreading scar* In the more superficial forms the scaling is very slight, and the resemblance to erythema is very close

The mucous membranes are affected in 30 *per cent.* of the cases, the red margin of the lips being the most commonly attacked. Next in order of frequency come the buccal mucosa, the palate and nasal cavity Patches of lupus erythematosus of the lips often have the appearance of a dried layer of collodion, while on the buccal mucosa the lesions are symmetrical white patches, usually with a red margin. They sometimes leave whitish cicatrices (Fig. 119). A poor peripheral circulation, vasomotor instability "dead fingers" and chilblains commonl precede and accompany this

type of lupus erythematosus and would appear to predispose to the disease when it affects the nose tip and lobes of the ears

Complications Epithelioma is the only serious complication of the chronic cases It is very rare and exceptionally there may be multiple cancerous tumours X ray treatment may have been the exciting cause of the malignant growths and it is contra indicated in any case

Polyarthritis as in other toxic affections is fairly common

Diagnosis Lupus erythematosus is characterised by its symmetry and superficial character by its marginal extension and the cicatricial destruction of the skin and its appendages It, however simulates very closely a number of conditions at its onset, and in some cases the progress has to be watched before a definite diagnosis can be made. The diseases resembling the early stage of lupus erythematosus are chronic eczema, psoriasis, acne erythema, and chilblains.

From lupus vulgaris the diagnosis is generally easy The eruption usually starts at a later age it is symmetrical and there are no apple-jelly nodules Ulceration is also exceedingly rare The only form of lupus which can lead to a mistake is the superficial type described by Vidal affecting the cheeks and nose and in which the nodules are very small

Very rarely lesions of lupus vulgaris and lupus erythematosus occur together as in a patient shown by Barber

Prognosis. *The present outlook appears to be that 30 per cent are* cured a similar percentage improved and about 40 per cent. are more or less refractory to treatment

Treatment of chronic lupus erythematosus Septic foci should be eliminated if possible. Exposure to bright light must be avoided especially during treatment with sulphonamides or gold. Sulphanilamide, sulphapyridine sulphathiazole or sulphamethazine may be tried in doses of 0·5 gm. t.i d. for one week and then b d. for six to eight weeks unless contra indicated by the patient s reaction or leucopenia If this fails gold therapy should be tried intramuscular or intravenous injections being given weekly for three months, beginning with the smallest available doses. Intramuscular bismuth or quinine bismuth iodide is a useful alternative to gold and less dangerous Suramin 0 5–1 gm. intravenously weekly sometimes succeeds. It was thought that penicillin would be of great value in the many cases of lupus erythematosus which appear to be allergic responses to streptococcal infections. We have used the drug systemically in doses totalling 1 to 2 million units and while some cases showed considerable improvement others were unaffected and none was cured These results are in agreement with the failure of full doses of the sulphonamides. The occasional success of a prolonged course of necessarily smaller doses may depend upon a carrier state in which the causative organisms are not destroyed by intensive treatment but if inhibited long enough may allow the sensitised skin to recover

Calciferol in doses of 100–150 thousand units daily has been tried in cases thought to be tuberculous and some improvement was noted but the outlook with this drug appears to be no better than with the sulphonamides and penicillin

If general treatment fails to clear the lesions they may be treated with carbon dioxide snow for 10–15 seconds or lightly painted with liquid

phenol. This local treatment merely hastens the atrophy which arrests the disease Lotio calaminæ is cooling and protects the lesion from light. X-ray therapy usually acts like ultra violet light in aggravating the eruption and is not advised.

Acute Disseminated Lupus erythematosus

Etiology The patients are usually young women, and between fourteen and thirty years of age In two-thirds of the cases there was clinical evidence of tuberculosis—affection of the glands, scars of gland abscesses, or phthisis. It has been held that lupus erythematosus of this type is a tuberculous exanthem, and there is some evidence in favour of this view though cases are met with in which tuberculosis appears to be definitely excluded. There was a family history of tuberculosis in 80 per cent. of Sequeira's patients. In many instances no exciting cause can be found, but there are several instances on record in which the eruption started apparently as the result of mental or moral shock. The non tuberculous origin of some cases must not be overlooked and we recognise that in one grave type of the disease there is more commonly a streptococcal origin. Such cases are attended with high fever and evidence of grave toxæmia.

The acute affection is rare and occurs particularly in young females already suffering from the disease of the chronic type, but occasionally it may run an acute course from the onset (Pernet). Sequeira saw a patient with a very acute outbreak. There were signs of bronchitis in the chest, and the young woman died, the autopsy revealing extensive tuberculosis of the lymphatic glands. There was a single fibrous focus in one lung In other cases there was no evidence of tuberculosis, the greatest care being taken at the post-mortem examination to investigate every possible site of the disease. In another case there was glomerulo-tubular nephritis, which caused death, and a single fibrous nodule at the apex of one lung In one fatal case a subphrenic abscess was suspected and an exploratory operation was performed. The surgeon found only evidence of generalised miliary tuberculosis. Multiple pyogenic abscesses in the viscera were present in some of our fatal cases. In others no post-mortem cause was found.

Course. The eruption begins as a number of pink or lilac coloured spots, which rapidly spread and become confluent, forming a butterfly patch across the middle of the face. The ears and scalp may be affected and symmetrical spots appear on the trunk and extremities. As a rule, the scaling of the lesions is very slight, and at the onset the resemblance to erythema multiforme is very close. Hæmorrhagic areas occurred in cases under Sequeira's care and bullæ sometimes filled with blood may be present. The patient is gravely ill, and there may be high fever and prostration. The later stages are those of acute septicæmia, with terminal pneumonia, phthisis nephritis or meningitis. In the acute stage, albuminuria is common. A subacute form occurs in which the eruption is of the disseminated type, but there are no grave constitutional symptoms, although the patient is usually in a weakly condition, easily tired and lethargic. Recurrences occur in this type, sometimes after long intervals.

other reticulo-endothelioses and as a prodromal eruption in measles and other fevers.

Pathology Urticaria is produced by the development of histamine in response to various types of irritant (*vide* p 10). Presumably histamine is produced in excess or is not adequately broken down by histaminase in the bowel or filtering organs such as the liver If the histamine level is not raised then certain factors concerned with the threshold of reaction by the capillaries must account for the urticarial eruption

In some instances it would appear to be an anaphylactic phenomenon, particularly in the recurring type This hypothesis would bring urticaria



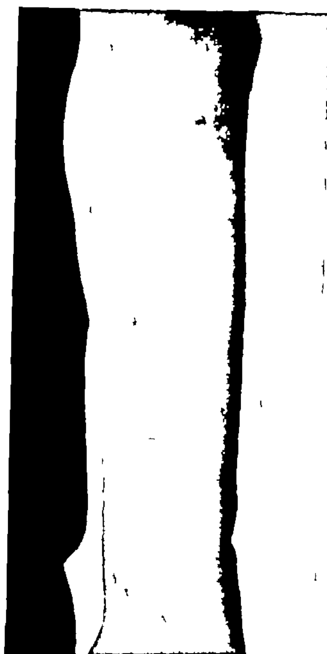
Fig 1*1 Urticaria

into the same group of diseases as asthma, epilepsy and migraine and is supported by observations on the similar action of alcoholic extracts of blood from these diseases on the cat s intestine an action simulating closely that of pilocarpine (S van Leeuwen and Zeydner)

Black and Howells found that 65 per cent. of chronic cases of urticaria had a diminished level of prothrombin in the blood. Of these 60 per cent. were relieved by vitamin K (*vide* treatment) The greatest relief occurred in patients in whom the coagulation time was prolonged

The lesion is a localised inflammatory œdema of the true skin with an enormous number of polynuclear leucocytes increase in the number of lymphocytes and sometimes of the mast cells. At the centre the pressure

PLATE 27



URTICARIA

The flat wheals are distinctly raised and show the characteristic white centre

[To face p. [illegible]

of the effusion is great enough to cause anæmia, and this produces the white centre of the wheal. In pomphi developed artificially and excised for examination cellular infiltration is found to occur in a few minutes. After six hours eosinophiles were present (Gilchrist).

Clinical features. The onset of urticaria is acute sometimes with a slight degree of fever (99.5 to 100 F.), but oftener without. The patient's attention is usually first attracted by the intense itching. There may be evidence of gastro-intestinal irritation, vomiting diarrhœa, etc., but this is often absent.

The eruption consists of well-defined white or pink swellings of the skin, rarely more than an inch in diameter. The margin is often red, while the centre is pale. The lesion is exactly similar to the wheal produced by the stinging nettle. The scratching induced by the itching brings out fresh wheals, and mechanical irritation of any kind, such as rubbing, may excite them in the hypersensitive skin. A special characteristic of the urticarial wheal is its rapid development and its equally rapid and complete disappearance. It leaves neither scale nor stain. An individual wheal may last for a few hours to several days. Asymmetry is the rule, and there are remarkable variations in the extent of the eruption. In rare cases, nearly the whole of the cutaneous surface may be involved, and also the mucous membrane of the buccal cavity pharynx, larynx, and probably the lining membrane of the hollow viscera, as indicated by asthmatic attacks and vomiting. In a unique case which Sequeira saw in consultation with Dr Henry Head the urticarial attacks were associated with epileptiform seizures. The patient was a boy of sixteen, otherwise healthy (see Plate 27).

Certain variations from the common type require mention. In *papular urticaria* the lesions are small, and the papular element persists after the disappearance of the wheal (*vide* Strophulus). In *U gigans* the wheals are enormous, sometimes reaching the dimensions of an egg. *U bullosa* is the name given to wheals in which the central part is raised by serous effusion into a blister. Hæmorrhage into the wheal is indicated by the term *urticaria hæmorrhagica*. The last variety may be associated with hæmorrhage from the kidney stomach and bowel. *Factitious urticaria* is the name applied to wheal lesions produced by local irritation for instance stroking the skin sharply with the finger nail or some sharp instrument causes an immediate development of linear pomphi in susceptible subjects (Fig 122). Dermographism.

Urticaria tuberosa is a rare variety characterised by the rapid development of multiple asymmetrical subcutaneous or deep-seated swellings varying in size from a pea to an orange. The extremities, especially the fingers, hands, wrists, feet and knees are most frequently affected. The fingers show fusiform swellings between the joints. Aching, pain, stiffness and tingling or burning cause the patient sleepless nights, which are followed by languor and weakness. There is no fever and the lesions, which usually develop at night, only last a few hours. They are distinguished from rheumatoid arthritis by the absence of articular changes, grating etc. Recurrences are common.

The duration of urticaria varies a great deal. It is usually an acute affection lasting from a few hours to a few days or a week. But, in some

cases, it runs a chronic course evanescent wheals *appearing again and again*, perhaps for months or years. Ingram had a case in which attacks of urticaria were associated with attacks of tetany and could be brought about by hyperventilation He believed there was a neurotic basis. In very rare instances, *individual urticarial lesions last for some weeks to several months* it is difficult to recognise these as urticarial lesions, but factitious pomphi may always be developed Such conditions probably have a different cause similar wheal like lesions being seen in leukæmia cutis and mycosis fungoides The nodular or so-called verrucose urticaria may be of similar origin

Diagnosis The diagnosis of nettle-rash is usually easy Erythema multiforme is distinguished by the more persistent character of the lesions, *their colour distribution* and less irritation Measles in an adult may lead to difficulty The urticarial eruption is more irritable and there are no catarrhal symptoms and the fever is less or absent. Koplik s spots should

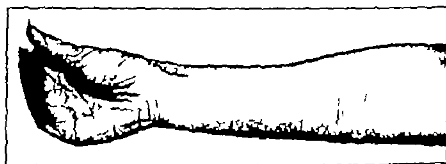


FIG 122. Urticaria factitia.

be looked for Rubella is attended by enlargement of the lymphatic glands in the neck.

Drug eruptions of urticarial type may lead to difficulty but here the origin of the urticaria, and not its differential diagnosis, is at issue Inquiry should always be made as to the taking of drugs.

In cleanly subjects scabies should not be forgotten. Intestinal worms may also cause urticaria

Prognosis In its acute form urticaria clears up in a few hours to a few days The recurrent type is amenable to treatment with our increased knowledge of the importance of psychological and biochemical treatment

Treatment. In acute cases a purgative should be given A dose of calomel at night, followed by a saline aperient in the morning, is usually most efficient If there is evidence of gastric disturbance a simple emetic is also useful Pituitrin adrenalin or ephedrine usually give rapid relief

The local treatment consists in warm baths, with a teaspoonful of bicarbonate of *soda to the gallon, or of potassa sulphurata* half a drachm *to the gallon.* This should be followed by the application of a lotion of carbolic acid (1 in 50) or of the tar and lead lotion Dusting the surface afterwards with a powder of zinc and starch is comforting *An ointment* of beta naphthol, half a drachm to a drachm to the ounce or of salicylic acid 2 per cent. relieves the irritation.

The treatment of chronic urticaria should be based on the following considerations:—

(1) The exclusion of any particular *food* as a cause, either by dietetic investigation or by skin tests. Drugs as excitants must also be considered and a careful history may be helpful.

(2) *Non-specific food sensitisation* should next receive attention. Alimentary and "lienteric" urticaria may be controlled by the administration of peptone half-an-hour before meals (5–10 grains in a cachet).

(3) *General debility* especially iron deficiency and nervous conditions, may be factors determining the persistence of the urticarial state and these are controlled by large doses of iron or sedative-tonic measures.

(4) *Biochemical imbalance* especially excess of carbohydrates in the diet, is important in some cases and is dealt with by limiting the carbohydrates ingested, by the administration of small doses of insulin and increasing the aneurin or total vitamin B complex in the food. Calcium and its complementary vitamin, calciferol, are sometimes effective although the blood calcium content is usually normal. The liver so important biochemically may be the determining factor in urticaria.

Black and Howells found a diminution of prothrombin in the majority of patients suffering from chronic urticaria, who had not been relieved by trial diets, the search for infections or allergens or the avoidance of drugs. Sixty per cent. of such cases were relieved by the oral administration of vitamin K, in the form of menaphtone (B.P.) in 2 milligramme doses thrice daily before meals. Some patients were relieved in two or three days, but most required three to four weeks treatment. Relapses occurred in one-third, but were usually relieved by further treatment on the same lines. In our hands the results have not been so successful.

(5) *Endocrine factors.* Since many urticarial eruptions respond quickly to injections of adrenalin or pituitrin and often to ephedrine by mouth, it would appear that endocrine factors are important; indeed, since the endocrine glands are influenced by emotional states and they largely control the vegetative nervous system, their effect in urticaria is not surprising. Other hormones are less potent, but we have seen a dramatic effect from ovarian follicular hormone in urticaria at the menopause. Experience with extract of spleen failed to confirm the report that the substance was a potent remedy for urticaria.

(6) We believe that in the past too much stress has been laid upon the relationship of urticaria to septic foci and toxaemia from sepsis, although we realise that such foci and abnormal metabolic processes of pelvic or gall bladder origin may occasionally be causative.

(7) The purely psychological group, a considerable proportion of the *chronic* urticarias, can often be dealt with by a little homely psychology, sedatives, a tonic, and vitamin B therapy. In a few resistant cases the assistance of the psychotherapist may be required.

(8) There are rare cases of urticaria in which the most careful investigation fails to indicate a cause. In some of these, "shock" therapy has proved of value. We have seen great benefit from *auto-haemotherapy* the removal of 5 to 10 c.cm. of blood from a vein and its immediate injection in the gluteal region. Injection of sterile milk, aolan, etc., has also proved successful.

An injection of adrenalin or pituitrin as for asthma may sometimes abort an attack or relieve the intense irritation *Ephedrine hydrochloride* and phenobarbitone together (½ gr doses) have a more prolonged effect.

The treatment of urticaria tuberosa is on the lines described for the more common varieties

Angio-neurotic œdema Giant urticaria Quincke's œdema

Etiology Angio-neurotic œdema may begin in infancy but is most common in early adult life Both sexes are affected females rather more frequently than males. The disease is rare and less common in hospital than in private practice Heredity occurs in a remarkable proportion of the cases Of 141 persons in seven generations, 19 were affected and 1° died from suffocation caused by laryngeal œdema. Other predisposing causes are menstruation, hysteria melancholia and Graves disease The exciting causes are cold injury diet, drugs, and nervous conditions, such as neurasthenia, worry overwork fright and insomnia Digestive troubles are also known to cause an attack.

Clinical features The majority of the attacks occur between 1 and 5 A.M The eruption is characterised by circumscribed swellings which disappear spontaneously in a few hours to a few days. The swellings may be the same colour as the skin or of a waxy appearance and cold to the touch or red and hot. In rare cases there are ecchymoses. The lesions are firm and elastic or hard. On the extremities they may be as large as a nut or an orange on the face and hands and external genitals the swellings may be enormous. The lesions are generally asymmetrical and may be widely separated Itching and stiffness are experienced The lips, palate pharnyx and larynx are often involved and sometimes the trachea and intestines The outbreaks occur at irregular intervals and sometimes, like asthma appear to depend upon certain localities. Like some cases of urticaria and asthma, angio-neurotic œdema would appear to be an allergic phenomenon Hæmoglobinuria, albuminuria, tachycardia, and purpura, and also abdominal crises such as are seen in Henoch's purpura may occur When the pharynx or larynx is affected sudden œdema of the glottis may cause a respiratory crisis calling for intubation or tracheotomy Many deaths have been reported, but we have not had a fatal case and the prompt use of adrenalin or pituitrin usually averts the danger

The **diagnosis** of angio-neurotic œdema from lymphangitis of the face is not difficult, as the latter condition is more chronic and is attended with persistent swelling

Treatment. Great care must be taken to find out whether any drug especially aspirin, or article of diet is an exciting cause Treatment is on the same broad lines as described for chronic urticaria but adrenalin ephedrine or pituitrin often stop or restrain the eruption if given early Sedatives and reassurance are particularly valuable

Papular Urticaria Strophulus (Gum Rash. Lichen urticatus)

Etiology Strophulus is a disease of early infancy It usually occurs about the period of dentition, and is so common that very few children

do not suffer from it to a greater or less degree. Occasionally it may appear in older children. Essentially it is an allergic response of the skin and usually responds to a change of environment. Exceptionally it is the reaction to a specific food allergen. It is often associated with over feeding with carbohydrate, and with gastro-intestinal troubles constipation, diarrhoea, foul motions etc. Dental irritation is probably less important than the association of digestive disorders. Some authorities regard strophulus as a neurodermatosis, and it is considered as a form of prurigo. Nervous factors are undoubtedly of prime importance in some cases.

Pathology The papule of strophulus is a papillary oedema, with the infiltration of lymphocytes and dilatation of vessels as seen in urticaria. The corpus mucosum is also oedematous, and under the stratum corneum there is a mass of imperfectly formed horny cells, with a spongy condition of the cells of the epidermis resembling that seen in eczema, but the



Fig. 123. Bullous urticaria in child aged 1 4, small papular lesions on legs.

essential features are those of a circumscribed urticaria. Later cystic spaces may appear in the epidermis and approach the surface as clinical vesicles or bullæ

Clinical features. The onset is acute the child often being in good health, or perhaps a little out of sorts on account of the eruption of a tooth. The rash consists of papules and urticarial wheals. The wheal is evanescent, while the papule persists. Each papule is about the size of a pin's head, or a little larger of a pale pink colour or sometimes little different from the normal tint of the skin. The top of the papule may present a tiny scale or yellowish point In rare cases the lesion is vesicular or bullous and occasionally large clear blebs are the presenting features, the papules being sparse or absent. The papule is firm to the touch, and at the outset it is situated in the centre of a small wheal, which disappears in three or four hours. The papule itself lasts a week to a fortnight. Hence on examination the papules outnumber the wheals, but inspection at night will usually show fresh wheals. The top of the papule is often torn off by

the scratching of the child, and a small blood crust is found at the apex. The lesions may leave small brown stains.

The *eruption occurs on the limbs and trunk, the former distribution* being the more common In bad cases the face and neck may be affected, but the palms and soles nearly always escape excepting in infants. Crops of four or five to a dozen or more lesions appear and continue to come out daily for weeks. All stages of the lesions are thus present in a marked case The eruption, as a whole, may last *for three or four weeks to as many* months, and recurrences occur during the whole period of dentition in some children, and even after the eruption of the teeth has ceased. As a rule, however strophulus clears up when the child is three years old, and, if it should persist there is a probability that the condition is Hebra's prurigo which also presents shotty papules

The itching is variable and may be intense, the unfortunate child scratching constantly in the endeavour to find relief from the pruritus.

Diagnosis. *Strophulus has to be distinguished from* scabies, which is characterised by burrows and specially affects the palms and soles, often becoming pustular and from sudamina where there will be excessive sweating In older children the eruption may simulate papular erythema which chiefly affects the backs of the hands and the elbows—and papular *eczema, which is often associated with oozing areas, or there* may be a history of weeping The vesicular lesions may suggest varicella but the long continuance of the eruption, its peripheral distribution, and the absence of the peculiar glassy vesicles of chicken pox should prevent mistakes and the constitutional disturbance of an exanthem is absent.

Prognosis. The eruption tends to recur during the period of dentition and the attacks vary greatly in intensity but usually clear up in three or four weeks to as many months

Treatment. *As Hallam* demonstrated, *immediate cure of strophulus can* usually be effected by the removal of the child from its home surroundings to hospital Unfortunately returning the child to parental care is often attended by relapse The condition of the alimentary canal and the diet require careful attention. Meals must be given at regular intervals, sugar and starch being restricted and foods rich in vitamin B complex included Sweets, chocolates, biscuits, cakes, bananas, ice-cream, etc should be severely restricted and not allowed between meals. Bicarbonate or magnesia and rhubarb and grey powder or *fractional doses of calomel* are usually given with great benefit. Where the itching causes grave insomnia chloral hydrate grs. iij for a child of three years is of service, or small doses of bromide may be given with the alkaline mixture. *A few* good nights are usually followed by considerable improvement in the *general condition* The child should be bathed in a weak alkaline solution, one drachm of sod. bicarb to the gallon The itching is usually relieved by the application of 2 per cent. of phenol in lead or calamine lotion.

Purpura

Purpura, or hæmorrhage into the skin, is classed as "symptomatic" where *the cause is known* and "idiopathic" where the etiology is obscure

Eli Davis in an analysis of 500 consecutive cases found 63 per cent. to be "symptomatic." (*Lancet*, August 7 1943, p. 160).

Etiology Hæmorrhage into the skin occurs —

(1) As an *inherited familial* affection.

(2) From local *injury* to the skin and superficial vessels, *e.g.*, in contusions, insect bites, rupture of varices.

(3) In *infections*. In the *acute fevers* as—

(*a*) A characteristic feature in typhus, cerebro-spinal fever Rocky Mountain and Tsutsugamushi fevers.

(*b*) A *rare episode* commonly denoting malignancy in small pox, measles, diphtheria and scarlet fever dysentery cholera, yellow fever plague, relapsing fever malaria and blackwater fever

(*c*) In *bacteriæmia and pyæmia* from infection by staphylococci streptococci, meningococci, pneumococci, and very rarely in tuberculosis and syphilis. It may occur in pyogenic affections of the mouth, nose, throat, and middle-ear



FIG. 124. Senile purpura.

(4) In *rheumatism*. This connection receives special attention later

(5) In *chronic hepatic disease* and *jaundice*

(6) In *hypertension* renal or essential, and in cardiac failure.

(7) In *blood diseases*—anæmia, leukæmia, Hodgkin's disease, and the hæmolytic disease of the new-born.

(8) After the *administration of drugs* iodides, bromides, chloral, quinine salicylates, gold, sulphonamides, sedormid, adalin.

(9) In *poisoning* by tri-nitro-toluene.

(10) In *senility*

(11) In *certain vitamin deficiency diseases*, notably scurvy

(12) Without known cause (idiopathic).

It has been suggested that some forms of purpura are anaphylactoid, but we have seen no reason to support this hypothesis.

Essential pathology of purpura. (1) *Defects in the endothelium of capillaries*

(a) In scurvy—plasma and platelets normal fragility of capillaries *much increased*

(b) In senile purpura

(c) In toxic states—uræmia and cachexia, pregnancy etc.

(d) In infection. Sometimes the platelets are greatly increased when thrombosis may co-exist with hæmorrhagic lesions If thrombocytopenia develops the association with damaged endothelium may be manifest as purpura fulminans As a rule in acute infections the platelets diminish in the early phases, increase during convalescence and subsequently fall to normal limits.



FIG 123 Purpura. Extensive ecchymoses.

(2) *Reduction of platelets*

(a) In toxæmias and infections, as above

(b) In poisoning by inorganic and organic substances, arsenic, gold, T N T etc., sulphonamides The endothelium is probably damaged, too

(c) In chronic splenomegaly i.e., splenic anæmia and Gaucher's disease

(d) In diseases of the blood forming organs

N B Reduction of platelets may be due to —

(1) Proliferation of megaloblasts in pernicious anæmia.

(2) Proliferation of leucoblasts in leukæmia.

(3) Pressure atrophy of megakaryocytes and consequent thrombocytopenia due to primary or secondary growths of the bone marrow in which category pernicious anæmia and the leukæmias may also be placed

(4) Degeneration of the bone marrow in aplastic anæmia, agranulocytosis, and in malignant thrombocytopenia.

Clinical features. The lesions of purpura are (1) *petechiæ* small red or purple well-defined areas, not raised above the level of the surrounding skin. The colour does not disappear on pressure (2) *Vibices* red lines

or streaks. (3) *Ecchymoses*, large, flat, slightly raised red or purplish patches like bruises. (4) *Hæmorrhagic bullæ* blisters containing blood. The lesions appear suddenly and on fading pass through the colours of a bruise, purple greenish and yellow Several varieties of idiopathic purpura are recognised, but a comparison of their clinical features, and the difficulty in drawing hard and fast lines between them, suggest that they are merely differences in degree (Plate 28)

(1) **Purpura simplex.** In this form children are more frequently affected than adults. The condition may be familial and Dr Eli Davis reported 79 cases (including 75 females). The eruption consists of petechiæ and macules varying in size from 1 to 10 mm. level with the surrounding skin. The lower extremities are usually affected, but the spots may also occur on the upper limbs. Ecchymoses are apt to appear



FIG. 128. Congestive purpura in cardiac failure.

intermittently on the limbs, front of the chest and on the back (Fig 125) There is no fever and beyond slight malaise there are no symptoms. The disease is probably toxic the patient often being badly fed and living in unhygienic surroundings. Rest and good food lead to rapid recovery but there may be relapses. Neither vitamin C nor P is effective in idiopathic purpura simplex.

Essential thrombocytopenia, idiopathic purpura haemorrhagica. Morbus maculosus hæmorrhageus of Werlhoff is a more severe affection characterised by a decrease in platelets from a normal of 250,000–450 000 per c.mm. to 5 000–60 000 and abnormal sizes including giant forms may be present. The bleeding time is increased but the coagulation time is normal although clot retraction is retarded and incomplete. Fragility of the capillaries points to some defect of the endothelium.

There may be an acute onset and course with febrile symptoms and headache, but there are no articular pains. Sometimes the hæmorrhages into the skin precede the general symptoms. As a rule the eruption appears

first on the legs but spots may come out on the upper extremities and on the trunk. The lesions are petechial at the onset, but generally there are some large ecchymoses—sometimes as large as the hand—and occasionally subcutaneous hæmorrhages causing deep-seated swellings covered by unaltered skin. Bleeding from the lips gums, mouth, nose, stomach, intestine or kidney occur. In the less severe cases it is common to find small hæmorrhages into the soft palate. In the grave cases the loss of blood from the vessels may cause a profound anæmia but even then the *mortality is not high. The spleen may be palpable.*



FIG 127 Acute toxic purpura, enlarged liver and spleen. (Dr E. Davis.)



FIG 128 Schönlein-Henoch purpura with arthritis and melæna.

Treatment in the acute type is symptomatic and transfusions may be of value. Splenectomy should be considered in chronic severe cases.

(3) **Henoch's purpura.** Anaphylactoid purpura. The latter term has come into vogue and suggests an allergic basis for which the evidence is quite inadequate. Purpura simplex is sometimes included with Schönlein-Henoch purpuras under this title. This form occurs in children. The cutaneous lesions do not differ from those of the last group viz., petechiæ with erythema and urticaria. There are occasionally articular pains but the distinguishing symptoms are gastro-intestinal. They comprise colicky pains and vomiting and the passage of blood in the motions. The abdomen is tender and there is usually pyrexia. The attacks of pain and

sickness are recurrent and very suggestive of intussusception They last but a few days. Albuminuria is common. Recovery is the rule, but relapses may occur

It is believed that the abdominal symptoms are caused by hæmorrhage into the wall of the bowel and temporary paralysis of the section affected. Intussusception, which is stimulated by the recurrent colic, and melæna, sometimes actually occurs from local paralysis of the gut.

(4) Purpura rheumatica, Peliosis rheumatica (Schönlein's disease), (Gk. pelioma a livid spot), is sometimes regarded as a variety of anaphylactoid purpura. In this variety there are articular pains and swellings, in addition to the cutaneous lesions, but the arthritis leaves no deformity The eruption is symmetrical, affecting the legs and feet and the arms and hands and occasionally the trunk. The lesions vary in size from a pea to a shilling They are not flat, but raised like the lesions of erythema multiforme, which is often associated with the purpura. Urticarial wheals are also not uncommon. Sequeira had a case in which the eruption was mainly purpuric on the lower extremities, while that on the upper limbs was erythematous, and at a later stage the upper part of the trunk was covered with urticarial wheals.

The general symptoms are pyrexia, malaise and joint pains. Occasionally there is vomiting. Evidence of valvular disease of the heart is sometimes present.

Peliosis rheumatica is peculiarly prone to recur sometimes after the lapse of months, sometimes after several years.

(5) Purpura fulminans. In this fortunately rare type the hæmorrhages into the skin are extensive, but the mucous membranes are unaffected. The high pyrexia and death in a few hours suggest a microbic infection of peculiar virulence. Of sixty-five recorded cases eighteen followed scarlet fever

Meningococcal-adrenal syndrome. This condition, which has been not infrequently reported, must be considered here, as its outstanding features are its sudden onset, and extensive petechial eruption. The syndrome has all the character of a fulminating septicæmia. The patient on admission to hospital has a greyish pallor and is often cyanotic. The pulse is poor or imperceptible and the blood pressure very low Vomiting is usual and the vomit may contain blood. Diarrhœa is a frequent symptom. The infection is meningococcal and two types of reaction may be recognised. In one there are no symptoms suggesting intracranial disease beyond slight neck rigidity and that may be absent. The general condition is flaccid. Death may occur in twenty-four hours after the onset, but recovery is possible with early diagnosis and prompt treatment. The majority of cases, however end fatally

In the second type the general symptoms are the same, but there are coma, stertorous or Cheyne-Stokes breathing and other evidence of meningo-encephalitis.

At autopsy the characteristic feature is the peculiar plum colour of the adrenals, which show a narrow zone of hæmorrhage round the periphery and necrosis of both cortex and medulla. Visceral and serous membrane hæmorrhages are usual. In the other variety in addition to the adrenal changes, purulent meningitis and encephalitis with hæmorrhages are found.

Treatment Patients have been saved by early diagnosis and by the immediate intravenous injection of heavy doses of sulphathiazole or sulphapyridine If the patient is able to swallow the drug is continued orally in large doses If there be coma or vomiting intravenous injections should be continued It must be remembered that the patient is in a condition of shock and measures must be taken to combat this by warmth and stimulation. The adrenal symptoms are treated by repeated injections of glucose and of alternate doses of cortical extract intravenously every four to six hours and of desoxycorticosterone acetate intramuscularly

REFERENCE —BANKS H S. and J K. MCCARTNEY 1943 *Lancet* 1 771 Illustrations and literature

Diagnosis of purpura The lesions may be mistaken for those of *erythema multiforme, but the colour does not disappear upon pressure* Occasionally however in peliosis and in Henoch's purpura there are both *erythematous and hæmorrhagic lesions. Flea bites are small punctate* hæmorrhages, but they are surrounded by a zone of erythema at first, and do not come out in *crops*.

To say that a patient is suffering from "purpura" is merely to diagnose a symptom and is of no more real value than the application of the name "epistaxis" to bleeding from the nose The general condition must be carefully investigated with a view to determining the cause In some instances it will be found that the dietary is at fault, and that the condition approaches scorbutus in character (*vide* page 88) Particular attention should be paid to the spleen and lymph glands and studies made of the cytology of the blood bone marrow and spleen pulp Estimations of bleeding time (normal 5–15 minutes) clotting time (normal 4 minutes) and capillary fragility may be of value. Capillary hæmorrhages may be observed in the nail bed on examination with the skin microscope. In many cases, it must be admitted, it is impossible to determine the cause of the cutaneous hæmorrhages and we are obliged to make the diagnosis of "idiopathic" purpura.

Prognosis. With the exception of the very rare cases of *purpura fulminans*, the prognosis is good. As indicated in the clinical history *peliosis rheumatica is very prone to recur and it is not safe to give a* promise of freedom from future attacks in this variety

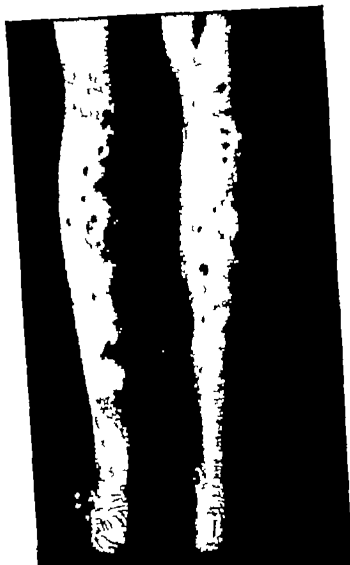
Treatment. *The mild cases do not require any special treatment.* If there is an extensive eruption, rest in bed should be enjoined. Any scorbutic tendency must be treated by giving plenty of vegetables in the diet, and lemon or lime juice and fruit, such as oranges, or ascorbic acid 50 or 100 mg t i d p c Vitamin K 2 mg t.i.d may also be tried

Calcium and vitamin D are popular but rarely effective remedies.

No specific therapy appears to be effective in idiopathic purpura simplex. In the symptomatic purpuras appropriate treatment should be given to the primary disease and in all cases efforts should be made to improve the general condition of the patient. Septic conditions of the mouth and throat should be treated by antiseptic mouth washes and gargles. Listerine, 10 per cent. is very useful

Adrenalin chloride (1–1 000) in doses of two to three minims, has proved very serviceable in *some grave cases.*

PLATE [illegible]



PURPURA

The purple rash is well marked. The colour did not alter on pressure

[To face p. [illegible]]

Subcutaneous injections of horse serum (20 c.c.) at intervals of two to three days proved successful in a grave case of purpura hæmorrhagica under Sequeira s care. In a severe case of the same type Emsheimer injected into the buttock 20 c.c. of whole fresh human blood obtained from a relative of the child with satisfactory results; such injections may be repeated.

Splenectomy has been performed with success in grave cases of recurring purpura hæmorrhagica in which there is marked diminution in the blood-platelets.

Schamberg s Disease

The condition may be defined as a peculiar progressive pigmentary disease of the skin characterised by the presence of minute telangiectases, pigmented and atrophic spots. According to Schamberg s original description the lesions consist of sharply defined, reddish-brown areas of varying size with small outlying pin head macules of the same colour The borders of other patches are made up of pin-point to pin-head sized puncta closely resembling cayenne pepper though darker in tint. Some present a telangiectatic appearance. These are the primary lesions which form the larger patches by peripheral extension. With involution, a brownish-yellow staining is left and small areas of atrophy may be seen. The disease usually begins on the shins and spreads to the ankles and dorsa of the feet, but may involve the knees, thighs, or arms in exceptional cases. Symptoms are rarely present.

The clinical appearances, and even the microscopical picture, may closely resemble the purpura of Majocchi and undoubtedly very similar lesions may occur in some cases of chronic varicose dermatitis (p 172)

The histopathology is that of a subacute inflammatory infiltrate in the upper layer of the dermis with dilatation of blood vessels and lymph spaces, proliferation of small vessels, diapedesis of red cells and the presence of hæmosiderin intracellularly or free Iron free pigment is also present. There is secondary atrophy of the epidermis.

The disease runs a very chronic course and treatment is unsatisfactory Local ultra violet light in mild erythema doses and 2 per cent. of ichthyol in calamine cream may be tried.

Pigmented purpuric lichenoid dermatitis. Gougerot and Blum described an eruption of small purpuric or telangiectatic, slightly raised papules, later becoming pigmented in varying shades. The lesions may be numerous and either discrete or aggregated into irregular patches. The lower extremities are most commonly affected symmetrically but the arms and trunk may be involved. Itching is variable and may be absent.

The condition is likely to be confused with Schamberg s disease (which is not papular), and with lichen planus.

It may be treated on the same lines as lichen simplex, but is apt to run a more chronic and refractory course.

Purpura annularis telangiectodes. This rare condition, first described by Majocchi, occurs most often in adolescence and early adult life.

MacKee collected 38 cases in the literature—31 males, 7 females. It has three stages :—

(1) *Telangiectatic stage* characterised by well-defined pink or red macules to ¼ inch in size. Under the glass they are seen to be composed of a network of dilated capillaries with numerous minute dark red puncta. The colour of the spots becomes paler on pressure, but the dark puncta are unaffected.

(2) *Hæmorrhagic pigmentary stage* The lesions spread very slowly and may reach 1 inch in diameter. The central parts lose their red tint and become pigmented while the periphery is still bright red, and contain many dark red puncta. The coalescence of these annular lesions produces various figurate patterns.

(3) *Atrophic stage* After a period of quiescence the lesions lose their sharp outline, the edge becomes pale and of a brownish yellow colour and



FIG 129. Purpura annularis telangiectodes (Majocchi).

finally the spots disappear the pigment being lost after the lapse of months. *Atrophy and alopecia of the affected areas may remain.* The patient complains of pain and pruritus. The several stages may be present simultaneously in different areas.

The eruption is bilaterally symmetrical and usually begins on the legs and dorsal aspects of the feet. The thighs, forearms, arms and trunk may be affected. *The whole process is slow in evolution and may last from several months to a year.* Histologically the essential feature is an obliterative endarteritis with cell infiltration round the capillaries. In the hæmorrhagic stage areas of extreme dilatation and engorgement are present. Diapedesis of red cells may occur and deposits of hæmosiderin are found in the corium. *The vessels chiefly affected* are those in the deeper parts of the corium and in the hypoderm. In the atrophic stage the number of vessels is diminished and the cell infiltration disappears, the papillæ are obliterated the glandular elements are atrophic, and the elastic fibres are diminished or lost. The occurrence of similar lesions as drug eruptions *following adalin or acetyl adalin suggests a toxic origin.*

The etiology is unknown.

This affection appears to be uninfluenced by treatment and the attacks usually cease in from eighteen months to two years.

Poikilodermia Atrophicans Vascularis. (Jacobi.)

The onset of this disease is usually a patchy erythema occurring on any part of the body but often on the larger flexures and axillary folds. The face is often spared. As the condition develops the variegated skin (Gk. poikilodermia) results from the appearance of telangiectases, minute



FIG. 130. Dermato-myositis and poikilodermia.

petechial hemorrhages, pigmentation, depigmentation, and miliary lichenoid scaly papules. The areas are usually covered with adherent scales, the skin is atrophic, and in places crinkled like cigarette paper. Sclerosis of the skin and muscular weakness are not found in poikilodermia, which differentiates the condition from dermatomyositis. There are no general symptoms and the disease is slowly progressive. The clinical picture is suggestive of X-ray dermatitis. The cause is unknown.

Histology The epidermis may be very thin over the infiltrated papules but normal elsewhere. The rete pegs are diminished in number but the remaining ones are sometimes elongated. The œdematous papillary body is densely infiltrated with lymphocytes and fibroblasts. The collagen and elastic fibres are unaltered except in the infiltrated areas.

REFERENCE—G B DOWLING and W FREUDENTHAL 1938. *Brit J Derm. and Syph.*, 50 510 (Including full references.)

Poikilodermia of Civatte. This disease is probably unrelated to the previous type of poikilodermia although the appearances on the skin consist of the same elements The disease usually occurs in women about the menopause and the eruption affects chiefly the sides of the face and neck. The pigmentation shows a reticular pattern and telangiectases and minute areas of atrophy make up the variegated appearance.

The etiology is also obscure, but occasional success has been claimed with ovarian hormone therapy and the condition is regarded by some authorities as an endocrine disorder

Poikilodermia of Jacobi and dermatomyositis Skin changes of a somewhat similar character are often associated with dermatomyositis (see p 199) where the essential change is œdema and infiltration of muscles followed by fibrosis and contractures Muscle weakness is an early symptom A reticular pigmentation telangiectasia follicular papules and hypertrichosis are seen particularly on the extremities and there may be preceding erythema and œdema (Fig 130)

Riehl's Melanosis In 1917 Riehl described a similar reticular pigmentary dermatosis usually of the face which is thought to be the result of inhalation of tar fumes or of contact with or ingestion of petroleum products Prolonged exposure to coal dust pitch or asphalt may also give rise to a melanosis and it is thought that the mechanism of its production is a sensitisation to light although pigmentation may appear at sites of friction or intertrigo Thus the face neck limbs groins and *navel may be affected The colour varies from a* reddish brown to a slaty black and is patchy and finely reticulate and so resembles poikilodermia Later atrophy and telangiectases increase the resemblance but keratoses and follicular lesions may help to incriminate tar and its products.

Erythose péribuccale pigmentaire de Brocq This is a rare peri buccal pigmentation almost peculiar to women The colour is *brown or* brownish red, it is symmetrical and well defined within the muzzle-area and appears to vary considerably in intensity from time to time. It appears to depend upon vasomotor tone influenced by endocrine and gastro-intestinal factors.

PLATE 29



ERYTHRODERMIA

Lymphoblastic type. Male aet. 40

[To face p.

CHAPTER XIV

ERYTHRODERMIA AND GENERALISED EXFOLIATIVE DERMATITIS (PITYRIASIS RUBRA)

The Erythrodermias

Erythrodermia. This name is usually reserved for the extensive or universal erythemata associated with varying degrees of scaling and cellular infiltration of the dermis. Quite often the cause of the condition and the clinical and histological pictures of the reaction are identical with or very similar to those of the toxic erythemata. Primary and secondary varieties are described and the latter will be discussed first.

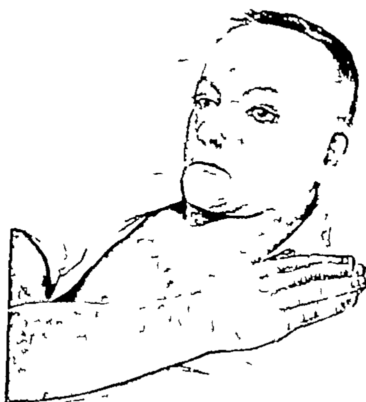
Secondary Erythrodermias

Not infrequently the erythematous eruptions due to arsenic pass from the localised forms mentioned into a universal erythema with exfoliation the skin is infiltrated and thickened and the condition is then a true erythrodermia. Similar conditions with less scaling also occur after toxic reactions to gold, mercury bismuth and antimony given internally and to certain drugs such as chrysarobin and oil of cade applied to the skin although in the latter instances the underlying condition, usually psoriasis, is probably the determining factor Even without irritating treatment psoriasis is occasionally followed by a general exfoliative dermatitis (or erythrodermia) which may persist for years and more rarely the same eruption is a sequel to eczema, seborrhoeic dermatitis, pityriasis rubra pilaris and lichen planus. In such cases evidence of the primary disease often exists, the erythrodermia runs a benign course and with its disappearance the original disease may reassume its ordinary character On the other hand, such secondary erythrodermias occasionally run an acute course and rapid wasting indicates a grave toxaemia with impending fatal issue thus showing no essential difference from a primary erythrodermia.

Erythrodermia also occurs in the *premycotic stage of mycosis fungoides* but there the unusual feature of intense itching which commonly precedes the eruption suggests the diagnosis. The lymph glands may be enlarged, but the blood count distinguishes mycosis fungoides from leukaemia which very rarely simulates it, and the late appearance of tumours is quite characteristic The *treatment* apart from that of the primary skin disease, i on the same lines as that to be discussed for the next group.

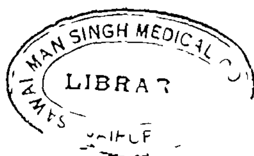
Lymphoblastic erythrodermia. Sequeira and Panton, 1925 described a series of cases of *Lymphoblastic erythrodermia*, the striking feature of which was a relative and absolute increase of the lymphocytes, especially the small lymphocytes, which were as much as 60 per cent. of total counts of 8,000 t 00,000. The skin (Plate 20) was described as of a dull rose redbrick colour with scaling Pruritus was a marked feature. Glandular enlargement was present in all but never to the extent seen in chronic

PLATE 40



ERYTHRODERMIA

Lymphoblastic type. Male aet. 40



[To face p.

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lymphatic leukæmia. The disease ran a chronic course over a number of years and was unaffected by treatment. These cases of lymphoblastic erythrodermia are still regarded in some quarters as manifestations of chronic leukæmia and the relatively low white count is ascribed to an aleukæmic phase. As a matter of fact, erythrodermia is a very rare complication of leukæmia and when it does occur it is usually scaly and the skin is appreciably infiltrated. Skin infiltration with nodule and tumour formation may occur in *myeloid leukæmia* but it does so without erythrodermia and has a characteristic blood picture. In Sequeira's cases lymphocytic infiltration of the skin only occurred in the last stages, which is a further distinction. It should be added that diagnosis is difficult in this group and in all cases examination should include the spleen and lymph glands; sternal puncture and repeated differential blood counts should be made and when possible biopsy of the skin and glands. Any of the reticulo-endothelioses or sarcoidosis may rarely give rise to an erythrodermia.

Primary Erythrodermias

A *congenital* form of *erythrodermic xeroderma* (ichthyosiform erythrodermia) has been described in which the ordinary type of xeroderma is

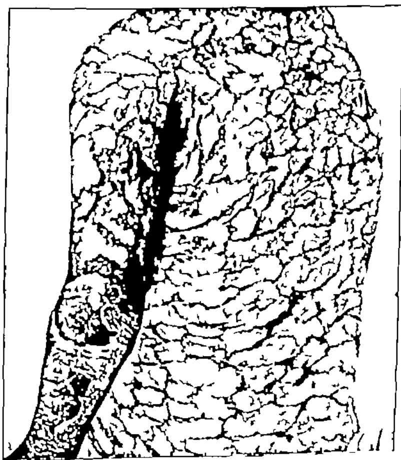


FIG. 131. General exfoliative dermatitis. (From a drawing of a patient under the late Sir S. Mackenzie.)

coloured by a general erythema. The erythrodermia may clear in six to twelve months to leave xerodermia. In infants this type has to be distinguished from the acquired exfoliative dermatitis of Ritter *i.e.*, a type of impetigo neonatorum.

The *acquired erythrodermias* may either be acute or chronic and the former is represented by the recurrent variety of scarlatiniform erythema previously mentioned.

The chronic varieties are two types of *exfoliative dermatitis* which have sufficiently constant clinical features to be regarded as clinical entities, although it is doubtful whether their etiology is constant. Some cases



FIG. 131. Exfoliative dermatitis. The photograph shows the affection of the nails.

arise as described under secondary erythrodermias and the skin condition progresses and becomes fixed in a chronic state quite indistinguishable from that about to be described. The probable explanation is that the skin is reacting to some toxin.

General exfoliative dermatitis of Erasmus Wilson. This is a subacute type of exfoliative dermatitis in which an erythema tends to become universal and the skin sheds large sheets of thick scales (Fig. 131).

Etiology. These cases are regarded as primary types because the condition arises without *obvious* cause, although a number have followed fright or exposure to cold. No clinical difference marks the secondary cases which follow for example intravenous arsenic or inunction of chrysarobin so that the division into primary and secondary types is

academic rather than practical Males are rather more affected than females and the disease is more common in middle age

Pathology The vessels in the upper layers of the dermis are dilated and around them is some infiltrate of leucocytes and small round cells. The epidermis is more affected than in the simple erythemata and the horny layer is thick, contains nucleated cells (parakeratosis) and is easily detached. Beneath this the leucocytes collect and probably assist detachment and there is oedema of the prickle cell layer and hypertrophy (acanthosis) but in later stages the epidermis is thinned by atrophy

Clinical picture The condition usually begins with malaise and moderate fever which may recur during the course. A patchy erythema is the precursor of the eruption which covers the whole body surface in a week or two and scaliness soon appears On some areas the scales are thin and papery but on the flexures, overlapping produces thicker layers and on the palms and soles hard plates separate more slowly The hair and nails (Fig 182) show dystrophic changes and may be shed. Desquamation is continuous and handfuls of scales collect in the bed The skin is hot, dry and tense and causes much discomfort. Interference with heat regulation makes the subject complain of cold The scalp is affected and in appearance resembles acute seborrhoeic dermatitis, the scales and crusts being matted in the hair As a rule most of the lymph glands are hard and easily palpable but not significantly enlarged (see Plate 30)

Course and prognosis The average case runs a course of three to twelve months. In about one in ten a fatal issue occurs and most of these follow a protracted course like that of Hebra's type which has little further to distinguish it.

Pityriasis rubra of Hebra Jadassohn. Dermatitis exfoliativa It is a moot point whether this condition is a separate entity from the above. In any case the resemblances are so numerous that a much briefer account will be given and the remarks on diagnosis and treatment apply to both.

It may be defined as a rare disease characterised by universal redness and fine scaling the skin being thin instead of thickened and infiltrated as in the subacute type described above This latter is a weak point because wasting takes time and ultimately occurs in both types, but pityriasis rubra has the further distinction of being usually fatal and in a percentage of cases is associated with active tuberculosis Consequently some authorities regard the disease as a tuberculide but perhaps a majority believe it to be a non specific toxæmia in which tuberculosis may be its occasional cause or merely a complication Nothing further need be added about clinical appearances but the prolonged course leads to wasting which with the atrophy of the skin gives a picture of an emaciated subject in a thin red, scaly integument which is too tight for comfort pale areas over prominences such as the knees and elbows and cracks in the flexures witness this Febrile periods intervene and the patients become susceptible to skin and systemic infection, the former resulting in boils, abscesses, ulcers and pressure sores the latter producing tuberculosis, pneumonia, enterocolitis, etc. which are often terminal

Diagnosis of exfoliative dermatitis The only real difficulty is to differentiate between the primary and secondary types for the appearance of general exfoliation is unlike anything else even the desquamation of

PLATE [illegible]



EXFOLIATIVE DERMATITIS

The plate shows the characteristic redness and desquamation. The nails and the hair were shed.

scarlet fever. Most of the secondary cases occur after parenteral medication with arsenic for syphilis or with gold for tuberculosis, arthritis and various skin diseases. The other common pre-existing disease is psoriasis then much more rarely seborrhoeic dermatitis, lichen planus, eczema, pemphigus foliaceus and mycosis fungoides.

Dermatitis exfoliativa neonatorum of Ritter von Rittershain must be mentioned here. This condition begins as a red exfoliating patch on the face or other parts of the body of nursing infants and the rash spreads and may become universal. Ritter thought it was pyogenic in origin and the presence of vesicles, bullæ and crusted septic fissures supports this view. Most cases resolve in a week or two.

Very similar cases in children have been described by others and these, like some adult cases, occur in epidemics indicating an infective origin. As regards diagnosis the clinical picture usually demands the term exfoliative dermatitis and the discovery of contact cases indicates that the skin condition is a manifestation of infection. (*Cf.* Epidemics of "pemphigus neonatorum" in maternity clinics, p. 446.)

Treatment. Care must be taken to avoid chills and skin sepsis to which patients with exfoliative dermatitis readily succumb.

General. Patients should be put to bed between blankets and pyjama suits made of surgical lint make other dressings unnecessary. Diet should be liberal with a large fluid intake. Treatment of secondary types depends upon the cause: if drugs, *e.g.* arsenic or gold, intravenous injections of sodium thiosulphate, 0·5–1 gramme in 10 c.c. of sterile distilled water may be given daily for six days. Its value is doubtful unless given early, and good results have been claimed for it in other cases of exfoliative dermatitis. If psoriasis is the primary disease, since the etiology of this is obscure, one has no specific indication for treatment, and so it often happens that the management of primary and secondary types of exfoliative dermatitis is the same. Quinine seems to be the most useful drug and these patients are often very tolerant of it, doses of v–xx grains, t.i.d. having been given without producing symptoms. Salicin and alkalies may be tried, but above all sedatives are indicated since insomnia and irritability are very common. Bromides and luminal are usually sufficient. Apart from the above measures general tonics and symptomatic treatment should be given. Large doses of ascorbic acid have been recommended, and we have found doses of 500 mg. daily to be beneficial.

Local treatment is simply palliative but the patient's comfort depends largely upon it. In the early stages the skin should be kept dry with cooling talcum dusting powder, but if sensations of heat, dryness and tension persist the lint pyjamas may be kept moist with a lotion of glycerine of lead subacetate and glycerine, one ounce of each to a pint of water as prescribed by Stephen Mackenzie. The dyes (gentian violet or brilliant green, ½ per cent. aqueous solution) have been found useful as in the erythrodermia due to arsenic. They probably act as in the treatment of burns. A lotion of liq. plumbi subacet. fort. one drachm to a pint of milk is also cooling. Although oils and grease keep the skin hot and are messy when mixed with the abundant scales, watery lotions and glycerine are often insufficient to moderate the dryness and then creams may be tried.

F g	Ichthyol, gr 20	or	Glycerine of lead subacetate, ♏180
	Lanolin, gr 60		Lanolin (anhydrous) gr 120
	Olive oil, ♏120		Glycerine of starch to one ounce.
	Lime water to one ounce		

Sometimes a simple oil is even better *e.g.*, olive oil or liquid paraffin, and if pruritus is marked phenol or eucalyptus oil up to 2 per cent. may be added but attempts to improve the simple emollients are fraught with disappointment

Light ointments with coconut oil or a cold cream base may be of service and combinations of tar or balsam of Peru 2 per cent. with 0 5 of sulphur and salicylic acid may suit the skin. Pastes are more protective and zinc paste with 1 to 2 per cent. of tar or ichthyol is useful for the cracks in the flexures.

Last of all baths are rather exhausting but may be tried with caution. Fractional doses of X rays to large areas are often of value.

CHAPTER XV

ERUPTIONS DUE TO DRUGS

ERUPTIONS DUE TO DRUGS (DERMATITIS MEDICAMENTOSA)

PROBABLY most of the drugs employed in medicine and just as many foods have at some time in some individuals produced skin eruptions. The ceaseless introduction of new synthetic remedies and the incorporation of old ones in the imposing disguises of proprietary preparations make it impracticable to prepare a comprehensive list of drugs which are reported to have caused eruptions. Fortunately such a list is unnecessary for a drug rash rarely gives a definite indication of its causative agent, the majority of such eruptions being of the common toxic varieties. Even so the abrupt, one might say the unexpected, appearance of the rash, its distribution, something unusual in the tint of the lesions and the frequent absence of constitutional symptoms may give clues to the etiology and naturally a working knowledge of dermatology facilitates the recognition of these features. When considering etiological factors in toxic eruptions it is important to exclude by enquiry the possibility of drug origin. In certain instances, such as the use of a toxic drug like arsenic in large doses, the appearance of a rash is looked for and when seen is accepted as a warning to suspend administration. It is known that arsenic can be detected in the skin in cases of arsenical dermatitis and Wigley has reported a similar finding in three cases of gold dermatitis. These observations suggest a directly related cause and effect, but in many drug eruptions the drug cannot be found in the reacting skin nor does the local application of the drug incite further reaction so that other factors must be considered.

Predisposing factors to drug eruptions.

(1) *Increased susceptibility of the skin.* This may be due to —

(a) *Idiosyncrasy* An innate peculiarity of the individual which becomes manifest by an exaggerated reaction to a dose within the normal therapeutic limits for normal subjects.

(b) *Allergy* by which one means a specific hypersensitivity to a drug acquired by its previous administration. It is often difficult to decide between this condition and idiosyncrasy since previous acquaintance with a drug may have been through a cough mixture, aperient, tooth paste, colouring or flavouring agent or a preservative, etc., and it is also possible that sensitisation is occasionally acquired *in utero* Allergy and idiosyncrasy appear to explain most drug eruptions.

(c) *Previous or existing disease of the skin* occasionally seems to determine the development or localisation of a drug rash. For example, acne appears to make an individual more likely to react to bromide with an acneform eruption and certain localised drug eruptions have been reported to have arisen on the sites of trauma and inflammation.

(d) *Photo-sensitisation, e.g.* actinic provocation of sulphonamide eruptions

(c) *Nervous irritability* is regarded by some authorities as a factor of great etiological importance. Certainly hyperidrosis and tremors of the fingers are common and may be associated with irritability, depression and insomnia, but allowance must be made for the toxic effect of the drug on the nervous system, for the discomfort produced by pruritus when present and for the anxiety caused by the alarming appearance of the rash.

(2) *Concentration of the drug in the skin*

(a) *Preparatory to normal excretion.* Excretion may be effected by the sweat or sebaceous glands or by exfoliation. Histological studies have revealed that in some cases the reaction of the skin to a toxic drug is not confined to the excretory glands which probably play a minor part in the reaction. As previously mentioned in the case of gold and arsenic, deposits of the metals are found in the reacting skin and it would appear in such cases that the skin was attempting excretion and that the exercise of this function led to disaster.

(b) *As a result of impaired excretion by the bowel and kidney.* *A priori* this would seem to be an important factor in the causation of drug eruptions but in actual fact it is rarely so. When administering toxic drugs, however, such as antimony, arsenic, bismuth, gold or thallium it is important to exclude the presence of renal disease and by repeated tests for albuminuria to avoid continuance of the drug if evidence of renal damage appears.

Mechanism of production of drug eruptions. As mentioned previously many patients with drug eruptions do not react to the local application of the drug but only to its ingestion or injection, which implies that the skin is not primarily reacting to the drug but to some sort of antibody or to a secondary allergen in the blood stream. For instance, Oriel showed that a patient who developed severe angioneurotic œdema after taking aspirin excreted a so-called proteose in his urine and this proteose gave positive skin reactions in the patient and in other aspirin-sensitive subjects. In other cases substances in the nature of antibodies are produced, and there is some evidence that these antibodies become fixed to dermal or epidermal cells and sensitise the cells to the drug or to a derivative of it. Since the common types of drug eruptions are erythematous or urticarial the basic cause of such lesions is probably the "triple response" of Lewis, because histamine or the "H" substance is produced when a drug damages any tissue. If the exudation is marked the lesions become more urticarial and vesicles or bullæ may develop.

Distribution of drug eruptions. As the method of production of drug rashes is similar to that of toxic eruptions the distribution of the lesions is generally similar also. Eruptions may be general or local.

Generalised eruptions are rare (*e.g.* with arsenic, quinine) and, as a rule, the rash is scarlatiniform with varying degrees of desquamation or exfoliation, but urticarial or morbilliform rashes also occur.

The *localised eruptions* are usually symmetrical and either arise on the forearms, face and neck or on the trunk. A few drugs give rise to *fixed eruptions* (Plate 33.) that is certain areas of skin constantly react to doses of the drug and by means of skin transplantations it has been shown that in the case of a fixed antipyrin eruption the epidermis was sensitised while with phenolphthalein the sensitivity resided in deeper undefined

tissues. These fixed eruptions may be asymmetrical and at times are solitary. Drug eruptions may appear on any part of the body.

Types of drug eruptions. The simplest and most frequent type of drug eruption is an *erythema* which may appear as small macules, irregular areas or extensive sheets. The eruption may be eczematous. Sometimes reticular patterns are seen and circinate lesions like erythema multiforme; in fact, typical eruptions of the multiform type have been recorded as drug eruptions. Rarely focal oedematous lesions like erythema nodosum occur. Sometimes a brighter hue or a lilac or cyanotic tint marks a drug eruption, probably because the drug affects the oxidation-reduction potential of the blood and tissues or causes alterations in blood pigments. Slight desquamation is common after acute erythematous eruptions and in severe cases, especially after arsenic, bismuth and gold, exfoliation in coarse sheets is common.

Drugs causing erythematous eruptions. Adalin, antipyrin, atophan, arsenic, belladonna, bismuth, borax, chloral, copaiba, hexamine, iodoform, mercury, opium, phenolphthalein, phenacetin, phenobarbitone, pyramidon, quinine, salicylates, salvarsan, stramonium, strychnine, sulphonal, sulphonamides, veronal, etc.

Urticarial eruptions are also common and are usually morbilliform. The lesions are raised according to the degree of exudate which, when gross, causes oedematous blotches resembling angioneurotic oedema. Aspirin most frequently, and iodides, pyramidon and veronal occasionally, produce such reactions. Many of the urticarial eruptions are erythematous too and may simulate erysipelas; aconite, bromides and iodides are the usual causes and the erysipelatoid zone which often surrounds the pustular lesions of bromide and iodide eruptions is helpful in diagnosis.

Adalin, antipyrin, bismuth, chloral, insulin, quinine, salicylates, santonin, sulphonamides, serum, etc., also account for urticarial eruptions.

Papular eruptions may occur with benzoic or boric acids and their salts, digitalis, eucalyptus, mercury, iodides, etc.

Vesicular and bullous eruptions usually arise upon an erythematous or urticarial base, but occasionally, especially when due to iodine or iodide, clear vesicles or blebs appear with no obvious erythema.

Drugs causing vesicular and bullous eruptions. Aconite, arsenic, bromides, chloral, iodides, mercury, quinine, veronal, etc.

Pustular eruptions may be sterile, but usually result from the infection of vesicular and bullous lesions and are due to the same drugs. Bromides and iodides produce follicular acneform or furuncular lesions through irritation of the follicles or by increasing their susceptibility to staphylococcal infection (Fig. 184.)

Granulomatous eruptions may appear during or after treatment with bromide or iodide.

Purpuric lesions arise when any drug rash is sufficiently toxic and have been reported after chloral, copaiba, ephedrine, gold, iodides, mercury, stramonium, etc.

Lichenoid eruptions from gold, arsenic, mepacrine, bismuth.

Pigmentation of the skin is most common after arsenic (Fig. 208), gold, and silver while bismuth, mercury and silver are apt to give pigmentary lesions in the mouth.

Hyperkeratosis is almost invariably due to arsenic if it be of drug origin it commonly *affects the palms and soles* (Fig 133)

Exfoliative dermatitis may occur after arsenic, gold bismuth, barbiturates and the sulphonamides.

Diagnosis. The points previously discussed which are helpful in diagnosis may be summarised thus —

(1) The abrupt onset of the eruption.

(2) The absence of constitutional disturbances as a rule.

(3) The symmetry of the eruptions with rare exceptions.

(4) Alterations in tint, the erythematous background being more vivid, or dull by the addition of lilac or cyanotic hues.

(5) The history of previous or present medication with a drug Sometimes *e g* with *arsenic, gold, iodide or bromide, a latent period may occur* between cessation of the drug and the appearance of the rash. A chemical analysis of the urine blood skin hair or nails may show the presence of the drug

(6) The peculiarity of certain drug eruptions facilitates recognition. For example, the giant urticarial lesions of aspirin the acneform, furuncular verrucose and nodular lesions of bromide and iodide the exfoliative pigmentary and hyperkeratotic lesions of arsenic the lichenoid and scaly lesions of gold and the peculiar fixed eruption of phenolphthalein all have very suggestive features Reference is made to these in the list of common drugs and their eruptions which is appended.

(7) Irritation is very variable but in generalised eruptions is often sufficiently marked to differentiate them from the exanthemata. Frequently irritation precedes the drug rash.

Treatment. *General* The first essential is to stop the drug when most of the minor eruptions quickly disappear Elimination may be hastened by saline aperients and there is some evidence that alkalies diminish the *reactivity of the skin to irritants so that mistura alba* has a two-fold action. In severe cases a vegetarian diet is indicated for its alkalising and detoxicating actions. Extra vitamin C is helpful in some cases *Alcohol increases the erythematous elements in skin eruptions and may facilitate* the absorption of residual drug or toxic products in the alimentary canal and should be forbidden It may be advisable to restrict tea, coffee and condiments In cases of bromide or iodide eruptions good results have been obtained by increasing the sodium chloride intake and by the use of 100 to 500 c.c of normal saline given intravenously two or three times a week.

Sodium thiosulphate is often given in arsenical dermatitis, in doses of xv–xxx grains by mouth t.i d. or v–xv grains intravenously It may assist elimination if given within a week of the last dose of the drug but is of very doubtful value later on. It may be tried in other metallic intoxications Intravenous injections of ascorbic acid 500 milligrammes daily for a week, followed by smaller doses orally have proved very successful in arsenical dermatitis (p 509) Encouraging results are being obtained with new methods of chemically neutralising toxic metals after absorption

B.A.L. a preparation devised to counteract the effects of Lewisite gas, which contains arsenic is dramatically effective in other forms of arsenical intoxication. It is probably of value in poisoning from other metals

Local treatment. The macular eruptions which respond quickly to withdrawal of the drug call for no special treatment, but calamine lotion is a helpful placebo to which may be added liquor plumbi subacetatis fortis 1 per cent. or if the lesions itch, phenol 1–2 per cent. The lotions of lead or of aluminum acetate are useful too with glycerine (2–10 per cent.) if the skin becomes too dry. When the dermatitis is severe and exfoliation makes the skin hard and taut, oils, creams and calamine liniment may be necessary. As long as the applications are quite bland it is safe to experiment to discover the most suitable.

Vesicular and bullous lesions are best treated with lotions and dusting

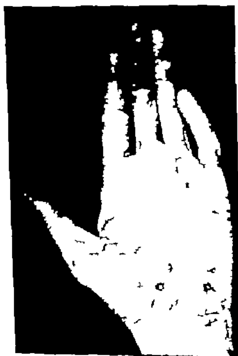


FIG. 183. Arsenical keratosis. Patient took arsenic for thirty-five years.

powders and pustular lesions with aniline dye lotions until they are dry.

The granulomatous lesions of the halogen drugs are often resistant and small doses of X-rays (150 r) have been recommended. Salicylic acid ointment is useful for the palmar and plantar hyperkeratosis which occurs after prolonged medication with arsenic.

List of drugs which may cause dermatitis medicamentosa. The following is a list of common drugs arranged in alphabetical order and indicates the type of eruption each may produce. Allowance must be made for considerable individual variation.

Acetanilide may give an erythema with a varying degree of cyanosis.

Aminophyllin may provoke fixed erythematous eruptions resembling toxic erythema or lupus erythematosus.

Amidopyrine (*pyramidon*) and *antipyrin* eruptions are usually morbilliform but erythema, urticaria and occasionally vesicular and bullous lesions occur. Fixed eruptions in the form of sharply defined erythematous plaques may follow ingestion of antipyrin by a sensitised individual.

Arsenic by ingestion may cause erythematous or urticarial eruptions, including allergic œdema of face and extremities and later a mottled rain drop pigmentation usually most marked on the trunk may appear (Fig. 208). Hyperkeratosis diffuse or focal of the palms and soles is a peculiar feature of late development (Fig. 133) and another rare delayed sequel is the warty papule which may become malignant. Drugs of the salvarsan type given by injection produce more acute and serious eruptions and the erythema which usually begins on the flexural aspects of the forearms may quickly involve the face and neck and become generalised as exfoliative dermatitis. Scales are shed in handfuls recovery takes months and a fatal issue is not uncommon (*vide* p. 275).

Massive doses of vitamin C and painting the skin with an aniline dye has greatly improved the course and prognosis. B.A.L. (British Anti Lewisite) now promises dramatic results.

The erythema arising about the ninth day after an arsenical injection is not a true drug eruption and should not interrupt treatment.

It should be noted that arsenic and other toxic metals at times provoke herpetic eruptions but these are not drug rashes in any sense but are manifestations of a latent virus infection. Other skin eruptions such as lichen planus may be provoked by these drugs.

Aspirin gives rise to erythematous and urticarial rashes with local œdema which is apt to affect the eyelids with alarming rapidity. Typical lesions of angioneurotic œdema may arise.

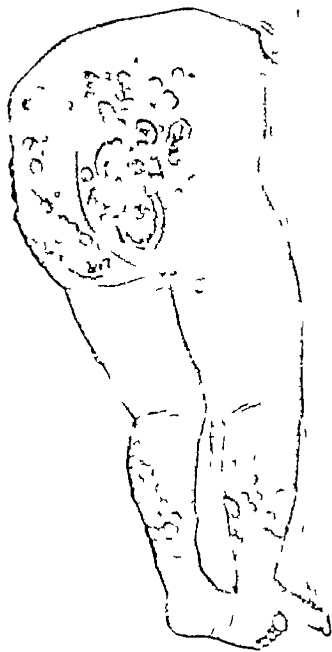
Atophan (*cinchophen* B.P.) may produce erythematous patches or well defined raised plaques and occasionally causes œdematous lesions like aspirin.

Belladonna usually causes a scarlatiniform erythema and absorption of the drug from eye drops or a plaster may produce the rash.

Bismuth has given rise to many types of eruption but the erythematous type is most common although urticarial bullous, lichenoid and purpuric lesions have been recorded.

Borax may cause erythematous, vesicular or scaly eruptions.

Bromides frequently cause acneform lesions. Small papulo-pustules are common and are apt to develop into boils and carbuncles which are often sterile and have a bright erythematous flare around forming a rather characteristic picture. Warty lesions occur and may present the appearance of aggregated pink flat warts or be moist and resemble small condylomata in which case the surface may be purulent and studded with small pustules. Other lesions are so hypertrophic that they simulate fungating neoplasms and since such eruptions may arise some months after cessation of bromide medication diagnosis may be very difficult (Plate 31). Nodular lesions resembling erythema nodosum and blind boils and bullous or vesicular eruptions also occur. Our own and reported cases indicate that babies may develop bromide eruptions *in utero* or from their mothers milk.



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Carbromal, B P (Adalin) may cause itching patches and Majocchi's type of purpura

Chloral usually produces a transitory scarlatiniform erythema widely spread and affecting the extensor aspects of the limbs. Papules, vesicles, pustules and purpuric lesions have also been reported and rarely affection of the mucous membranes

Chloroform inhalation may give rise to fleeting erythematous eruptions and rarely to purpuric lesions.

Copaiba and *cubebs* medication may be followed by dark red or purpuric macules or petechiæ affecting the lower part of the trunk and the extremities. More extensive eruptions suggesting scarlet fever or measles occur but itching is common. Febrile states and congestion of the fauces may increase the resemblance to an exanthem (see Plate 32).

Dacegan may produce a fixed eruption of erythematous type.

Digitalis has been credited with erythematous, macular and papular rashes.

Ephedrine may cause erythematous, urticarial and purpuric lesions which are paradoxical, since this drug is occasionally successful in quickly relieving urticarial eruptions due to other causes. A reasonable explanation is the production of a toxic (secondary allergen) as previously described.

Eucalyptus in a case described by Oppenheim gave rise to a bright red and brownish red papular eruption mainly affecting the extremities, associated with slight irritation.

Gold eruptions are erythematous like those of arsenic and often scaly purple, brown or pink guttate lesions like pityriasis rosea may occur on the trunk and be followed by very persistant lichenoid infiltration and a dusky pigmentation. Light sensitisation is common after gold and subsequent exposure to actinic light may produce a permanent pigmentation termed chrysiasis.

Guaiacum may cause blotchy erythematous plaques.

Hexamine may produce erythematous or urticarial rashes.

Iodides are responsible for the greatest variety of eruptions, in fact, the lesions exhaust all the possible reactions of the skin, *i.e.,* erythema, urticaria, papules, vesicles, pustules, bullæ, œdema, localised and diffuse, purpura, acneform, furuncular or carbuncular warty and hypertrophic lesions with nodules and tumours. Many of these reactions may be indistinguishable from bromide lesions but bullous and œdematous eruptions are much more common with iodide (Fig 134). Often small shotty papules arise and become surmounted with vesicles which pustulate and resemble variola lesions and likewise show predilection for the face and extremities. Gross œdema of one or both eyelids may occur especially when pustular lesions affect the lids. Localised red œdematous areas like erythema nodosum may arise on the extensor aspects of the limbs and more rarely on the face and trunk. A bullous eruption may rapidly become gelatinous and organised to form a granulomatous mass. The tumours or iodide granulomata may show a vegetating surface suggesting squamous-celled epithelioma, mycosis fungoides or pemphigus vegetans or resemble a fungating sarcoma or cutaneous blastomycosis.

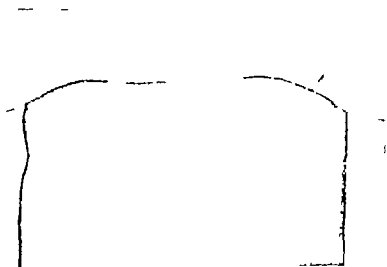
Granulomatous iodide eruptions are of serious significance and we have had several cases end fatally in spite of treatment. It is wise in

PLATE 32



COPAIBA ERUPTION

PLATE 33



FIXED ERUPTION — PHENOLPHTHALEIN

[To face p. [illegible]

erythematous and urticarial eruptions. The trunk is most often affected and the rash is patchy and may be reticular. Generalised scarlatiniform rashes and punctate erythemata like German measles occur but a lilac or cyanotic tint may generally be observed. Severe exfoliative dermatitis with fatal termination has been reported after phenobarbitone, and autopsy has revealed toxic lesions and inflammatory processes in many organs, thus indicating that the skin eruptions are but the outward visible signs of a widely spread systemic reaction.

Phenolphthalein eruptions are erythematous with a violet tint as a rule and may show brownish discoloration. Vesicles and bullæ may arise on the areas. The same sites may invariably react to further ingestion of the drug by a recurrence of the eruption, and for this reason such reactions are termed "fixed" eruptions. In one of our cases eruptions of this type occurred on a man's face: the lesions twice followed ingestion of phenolphthalein disguised in a chocolate laxative tablet. Sharply defined discs or circinate macular lesions are occasionally seen on the lower part of the trunk, buttocks and thighs. Vesicular and ulcerative lesions of the buccal mucosa have been reported (see Plate 33).

Quinine usually produces a scarlatiniform eruption with fever and later desquamation, mild or severe. The minute dose which may produce the rash in sensitive individuals emphasises the factor of idiosyncrasy previously discussed.

Urticarial, bullous and eczematous reactions have also been recorded.

Santonin may cause œdematous and urticarial eruptions.

Serum and foreign proteins most commonly give rise to urticarial eruptions arising from the sixth to the tenth day after the injection. Constitutional disturbances are usual and include fever, malaise, headache, vomiting and joint pains. Erythematous rashes are also common, alone or with the urticarial lesions which may be of the giant type. Any part of the body may be involved but either the trunk or the extremities are the sites of election. Variations in the time of onset and the types of rash are frequent. Sequeira had a case of severe urticaria lasting six months after an oral dose of horse serum given to prevent bleeding: the rash in this case appeared within twelve hours of taking the serum.

Silver nitrate may, after prolonged absorption, cause slate blue discoloration of the skin, termed argyria and due to the deposition of silver in the skin.

Sulphonamides. Sulphonamides have produced a wide variety of skin lesion and toxic effects. The common eruptions are scarlatiniform or morbilliform, patchy or generalised, and exfoliation may occur. These rashes are often associated with fever. Fixed erythematous eruptions have been described and lesions resembling erythema nodosum. The sulphonamides are apt to sensitise the skin to light and then dermatitis only follows exposure but once provoked the actinic dermatitis may behave like a drug eruption. Cyanosis has often been reported in sulphonamide therapy and appears to be dependent upon the production of methæmoglobin, but the mechanism of this reaction is not clearly understood. The cyanosis is dramatically cured by the administration of methylene blue ½ gramme intravenously.

The kidney is sometimes damaged by sulphonamides with resulting

suspected cases to do a skin patch test with iodide rather than to give the drug by mouth by way of therapeutic test.

Mepacrine produces hypertrophic warty lesions suggestive of lichen planus verrucosus The early lesions appear as eczematous or seborrhoeic manifestations but in course of time change to a pigmented lichenoid dermatitis which may persist for a year or more. It is usually extensive and includes the face neck, and mucous membranes where the lesions



Fig 134 Iodide eruption in a patient suffering from cardiac disease

resemble those of lichen planus Very hypertrophic warty lesions suggestive of lichen planus verrucosus may occur The condition must not be confused with chronic purpuric lichenoid dermatitis (p 271) There has been complete loss of hair

Mercury may produce erythematous eruptions like those due to arsenic. Boils are not uncommon during medication with this drug but appear to be due to diminished follicular resistance and not solely to the drug

Opium and its alkaloids may cause scarlatiniform or urticarial rashes which usually itch and may desquamate.

Phenacetin in rare instances produces erythema or urticaria.

Phenobarbitone (*luminal medinal*) and other *barbiturates* may cause

GROUP 4

DERMATOSES DUE TO EXTERNAL IRRITANTS

CHAPTER XVI

DERMATOSES DUE TO MECHANICAL AND PHYSICAL AGENTS

The normal skin is specially constructed to withstand a moderate amount of irritation, but in certain conditions, some congenital and some acquired, the resisting power is defective. The most remarkable examples of an inherited low resistance are seen in the conditions called epidermolysis bullosa, already discussed (p. 43), in which the least pressure or friction causes an outbreak of blisters and in the Ehlers Danlos syndrome (p. 67). But short of these there are numerous slight anomalies which render the skin peculiarly vulnerable Some of these will be mentioned incidentally in this chapter but we are here specially concerned with the eruptions which physical and chemical irritation may excite in a normal or apparently normal skin.

It has already been indicated (p 147) that there are two types of reaction to external irritants which are included under the term "dermatitis." The more severe reaction—traumatic dermatitis—is akin to a burn and will occur in any skin exposed to such irritants, as strong acids and alkalies and chemicals. The less severe and by far the commoner is a reaction of an inflammatory catarrhal character indistinguishable from an eczema of constitutional origin. Some authors would apply the label "eczematous dermatitis" to this condition. Such a reaction may develop in a sensitive or debilitated skin and not in a normal skin or it may be the result of idiosyncrasy *i.e.*, some personal and incalculable peculiarity for which no reasonable explanation can be offered. Finally this type of reaction may be the result of long-continued wear and tear upon a reasonably normal skin, and this is the explanation of a large proportion of the cases of industrial dermatitis.

Affections Due to Mechanical Irritation of the Skin

Blows, contusions, pinches, friction, and scratching may cause several kinds of lesion.

Erythema, or acute congestion, is produced by a slight injury There is local redness, with perhaps slight swelling heat tenderness and itching The colour disappears on pressure Lesions of this type rapidly disappear Prolonged pressure over bony prominences is the cause of erythema paratrimma, the first stage of the bed-sore

Wheals come next to erythemata in severity The lesion is at first red from capillary dilatation but later is pale from oedema, and is surrounded by a reflex arterial "flare" This is the "triple reaction" described by

anuria or hæmaturia, and one would expect this damage to aggravate or induce skin eruptions but this inference is not supported by clinical observations. The damage may prove fatal

The occasional occurrence of agranulocytosis and leucopenia should be noted as an indication to control sulphonamide therapy by examinations of the blood

Suramin (*antrypol*, Bayer 205) *germanin* may give rise to erythematous morbilliform rashes

Veronal may cause itching eruptions of erythematous or urticarial types with œdema and constitutional disturbance Vesication, crusting and desquamation may follow

Eruptions have also been attributed to the following drugs which by no means comprise an exhaustive list :—

Aconite, alcohol, antimony benzol bromural calcium sulphide cannabis indica cantharides, capsicum castor oil chloralamide cocaine, cod liver oil creosote, D D T ergot, iodoform, ipecacuanha, phosphorus, pilocarpine potassium chlorate, rhubarb salol, stramonium strychnine, sulphonal tar valerian, etc.

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Lewis There is a sensation of burning and itching or tingling The skin is in a condition of hyperæmia and œdema. A smart blow as with a whip or cane, produces a wheal It must be remembered that excessive wheal formation upon slight irritation is characteristic of urticaria (*vide* p. 237).

Ecchymoses and petechiæ *are effusions of blood into the skin* the common bruise is the familiar type Blows and pinches are the usual cause of these hæmorrhages The colour does not disappear on pressure and the stain may persist for some time going through a series of changes in tint Pinches of the end of the finger may lead to subungual hæmorrhage and cause the loss of the nail

Blisters or bullæ may also form from injury but friction is the most common cause, as in the blisters on the hands from the use of unfamiliar *tools rowing etc* The epidermis is raised by an effusion of serum, but sometimes the bleb contains blood Excessive blister formation from slight traumatism is a characteristic of epidermolysis bullosa.

Abrasions and excoriations are superficial breaches of the surface, due to friction and to scratching It is necessary to bear in mind that there is often some *itching affection, e g scabies,* which may be the cause of the patient scratching and also that abrasions may be produced artificially by hysterical patients or malingerers

Hypertrophies Recurrent mechanical irritation causes a *hyper keratosis—i.e.,* a thickening of the horny layer which when localised is called a callosity (p 297)

Tattooing The figures are produced by the introduction into the skin of Indian ink indigo and vermilion Accidental tattooing may occur from *the use of hypodermic needles with particles of carbon adhering* to the needle after being held in a match flame or from a rusty needle (Weber). A more common traumatic variety is seen after dirty abrasions (gravel rash) or blast injuries when dirt is driven into the skin. Infection of the tattoo marks with syphilis and tubercle is not very uncommon. Cheloid may also occur

The dermatologist is sometimes consulted as to the possibility of the removal of tattoo marks In some cases the pigmented areas can be *excised and skin graft applied* and *this is the most satisfactory* method. Multiple incisions and curettage of the under surface of thin skin flaps followed by resuture result in improvement but it is very difficult to detach foreign pigment from the tough fibrous tissue which has imprisoned it.

Lacassaigne and others have obtained good cosmetic results by very close cross scarification followed by the application, exactly to the scarified area of finely powdered permanganate of potash to form a continuous homogeneous layer This is rubbed in sufficiently hard to produce bleed ing *Dry dressings are then applied and removed as little as possible* until the crusts fall spontaneously

Pseudotuberculoma silicoticum. This is a tumour arising in a scar containing particles of silica almost invariably consequent upon a *fall* and graze of the skin Details of the following patient seen by one of us indicate the main features A woman, aged 40 had a scar on her right palm due to falling in the road twenty four years previously In this scar a pea sized tumour arose, of six months duration and was diagnosed as a possible fibro-sarcoma. Histological report suggested tuberculosis but

further careful examination showed that the tumour was a foreign body giant-cell and histiocytic reaction containing particles of silica, some of which were in the giant cells and were readily seen on examination under polarised light.

The condition was first reported by Shattock, S G., *Proc Roy Soc Med.*, 1910–1? Section of Pathology p. 6 See also Faulds, J S., *Journ Path and Bacteriol.*, 1935 xli., p. 190

Intertrigo

Intertrigo, or chafing, is the name given to lesions produced by the friction of two opposed surfaces of skin.

It is commonest in babies and may be due to excessive fatness The worst cases, however occur in neglected infants (Fig 185)

The regions affected are the groins, the sides of the scrotum, and the flexures of the thighs. Here the irritation of the urine and fæces and improper cleansing of the parts are important factors. Intertrigo in the folds of the neck caused by the irritation of fluid food is also seen in young infants

Intertrigo also occurs in the obese adult, the parts affected being the groins, the gluteal cleft, and, in fat women, the submammary folds. Colliers, labourers and others engaged in dirty work and soldiers on active service who are unable to attend to personal hygiene are frequent sufferers Factors of general debility may need attention in these cases and glycosuria by reason of its general and local effects must always be excluded.

The friction first produces an erythema, and the moisture due to retained perspiration or irritating urine and fæces causes the sodden horny layers of the epidermis to be removed, with the result that a raw oozing surface is formed.

Infection by micro-organisms may lead to ulceration and to a spread of the inflammation beyond the areas first involved.

Lesions suggesting intertrigo in the groin and between the toes are often due to infection by a fungus and a so-called intertrigo in the sulcus between the ear and the scalp may be caused by pus-cocci. The term intertrigo qualified by such adjectives as pus-coccal, seborrhoeic or mycotic is a convenient indicator of dermatoses in these regions.

Erosio interdigitalis blastomycetica (Fabry). This name is given to a troublesome condition occurring chiefly in dish-washers, and frequently in negresses and Jewesses according to American authors. The webs between the ring and middle fingers of both hands and other interdigital spaces are affected The erosion extends for about half-an-inch along the adjacent sides of the digits. It has an undermined white sodden border which is slightly raised The floor of the ulceration is red and glazed. Similar conditions have been seen in other flexures. It is suggested that they are due to infection with yeast-like organisms (*vide* Moniliasis).

Treatment. The parts must be carefully cleansed, and irritant soaps must be avoided

Calamine liniment or dusting powders are applied. Bismuth subgallate alone or with 25 per cent. of zinc oxide and talc is also useful. Dusting powders are applied after washing A useful powder is made of equal parts of oxide of zinc and powdered starch or talc. If the parts are

ulcerated, a little calomel 1 in 10 may be added to the powder or boric acid ointment or a mild mercurial ointment (hydrarg oxid flav grs. 15 to pasta zinci ℥i) may be applied

A useful lotion is liq picis carbonis ♏xx acid tannic grs. xx, aq. ad ℥i

With persistent or recurrent intertrigo the various aniline dyes, as



Fig 185 Intertrigo.

brilliant green and gentian violet are often valuable, probably by dealing with secondary saprophytic infection Fractional doses of X rays are also most valuable in adults

Napkin Erythema Ammonia Dermatitis

In babies eruptions due to local irritation but differing from intertrigo in affecting the convex surfaces are common. The eruption is of a dark red colour and the surface is smooth and shining It is confined to the convex surfaces of the buttocks the lower part of the back the backs of the thighs, the calves and heels and the perineum and scrotum and vulva, that is parts in contact with the napkin. Secondary smaller lesions may appear on the trunk The *flexures are free* from the eruption

Moist flat topped papules up to 1 cm in diameter may arise on this dermatitis especially in the region of the genitals and convex surfaces of buttocks. They are discrete and commonly ulcerate and closely resemble the syphilitic condyloma in appearance

Jacquet describes several stages of the affection (1) erythema, (2) erythema and vesication (3) papules and (4) ulcers Brocq believed that the eruption was caused by streptococci There is no doubt that micro-organisms found in the stools and over the buttocks have the power to split urea and produce ammonia, and that this is the irritant. There is

often a strong smell of ammonia after the infant has wetted the napkin during sleep and it is now generally recognised that ammonia is the primary cause. The more severe papular and ulcerated lesions are doubtless due in part to secondary microbic infection.

These conditions are common in neglected infants seen in hospital and dispensary practice, but they are occasionally met with in well tended babies.

It will be seen that the eruption is confined to the parts which are in contact with the napkin, and neglect in changing is the common cause. In some infants, however, the excreta appear to be extremely irritating, and the cause of this is usually gastro-intestinal trouble.

Diagnosis. These eruptions are of considerable importance from the

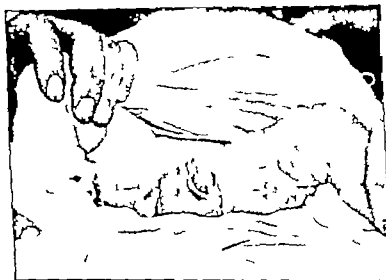


Fig. 134. Napkin erythema (the actual flexures are unaffected).

point of view of diagnosis, because they are frequently erroneously called congenital syphilis. They have also to be distinguished from intertrigo, from seborrhoic eczema, and from impetigo.

Differential diagnosis of the eruptions in the napkin region.—

The *napkin dermatitis* is dark red and shining and diffuse. It affects the convex surfaces, buttocks, back, back of the thighs and calves, and the perineum and scrotum, avoiding the flexures themselves. These are parts actually in contact with the napkin.

Congenital syphilis. The eruption is of small coppery red infiltrated papules not specially confined to the napkin area, but often condylomatous in the moist flexures round the anus. The palms and soles are often affected and there may be lesions on the face. There are snuffles, and a peculiarly wizened expression of the face. The specific eruption comes out from three to five weeks after birth, and the napkin erythema often starts later.

Intertrigo is distinguished by the lesions beginning in the flexures of the groins thighs and elsewhere. The eruption may however spread on to the convex surfaces but the flexures themselves are always affected and show the deepest colour which fades at the periphery

"*Seborrhœic dermatitis* may affect the napkin region. The areas involved are well defined and moist, and are usually covered with a greasy scale of a yellowish colour The lesions may also be found in other flexures, particularly in the axillæ and it is common to find that the child s mother has pityriasis capitis

Impetigo may complicate the napkin erythema or intertrigo. Vesicles and pustules occur and in a part subject to irritation they rupture early and produce raw oozing surfaces Frequently evidence of impetigo of the common type is present elsewhere or there may be other cases of pyococcal infection in the family

Yeast infections Mycotic infections are uncommon in infants but pathogenic yeasts may give rise to scaly dull red macules in the peri-anal region or extending to the buttocks and thighs The well-defined scaly edge may suggest tinea

Monilia infection of the napkin area is often associated with buccal moniliasis (thrush)

Treatment of napkin erythema The treatment is on the same lines as that of intertrigo The parts must be kept clean, and no irritant soap should be used. Lotions of boric or tannic acid are useful Protection of the affected areas is best obtained by the application of vaseline or liquid paraffin for unlike the vegetable oils they are unaffected by the strongly alkaline urine or by Lassar s paste (zinc oxide 24 parts powdered starch 24 parts salicylic acid 2 parts and vaseline 50 parts) If there is ulceration boric acid ointment, or ung hydrarg ammoniat 5 grs to the ounce of a paraffin base may be used with advantage

The production of ammonia in wet napkins can be prevented by giving the infant small doses of hydrarg cum cret. and by having the washed napkins rinsed in 1 in 4 000 hydrarg perchlor solution or in a saturated solution of boric acid before drying to inhibit the growth and activity of the organisms which hydrolyse urea producing ammonia.

Scratched Skin

Scratching of the skin produces excoriations or denudations of the epidermis as deep as the stratum mucosum These are common epiphenomena of the itching diseases, such as scabies pediculosis eczema, strophulus and the prurigos They are also met with in the rare diseases mycosis fungoides and leukæmia cutis The excoriations are usually linear but where the primary eruption is papular the tops of the papules are scratched off and small blood crusts form at the apices In some rare conditions the scratching is deep the patient endeavouring to tear out the irritating spots The worst lesions of this kind w have seen were in a case of leukæmia cutis Infection of the abrasions by pyogenic cocci causing impetigo boils etc. is common. Prolonged scratching causes pigmentation and thickening of the integument and sometimes lichenisation. The last term is applied to a chronic thickening of the skin with exaggera

tion of the normal lines enclosing minute elevations of the skin producing a quadrillated surface which resembles shagreen leather (*vide* p. 175). In chronic generalised prurigo discrete papules and even nodules may appear as a result of intense and persistent scratching

The *treatment* of the scratched skin is the treatment of the cause The irritation should be allayed by destroying the itch parasite or the pediculi by appropriate treatment in eczema, etc. If the cause can be removed the itching ceases, and simple soothing remedies rapidly heal the excoriations. Phenol or liq picis. carbonis, 1–3 per cent., in lotions or creams is a valuable antipruritic. Local anæsthetics are best avoided. For the more chronic conditions emollient ointments and keratolytic preparations to destroy the thickened horny layers are necessary (*vide* Formulæ). Applications of the X rays and of the Kromayer lamp are sometimes of great service. Sedatives such as bromide and luminal are often very helpful; the latter drug appears to depress the scratch reflex.

Cracked finger ends. Exposure and rough work may cause painful cracks about the ends of fingers and thumbs and some folk are very prone to such cracking, especially in winter It is a source of disability and may allow entry of infective organisms. Protection of the finger ends by elastoplast or by plastostrip (an antiseptic tape which adheres to itself and not to the skin) is helpful and is a necessary protection in certain industrial processes. Cracks are well treated by filling them with cobbler's wax, Durofix or collodion and may be prevented by salicylic acid ointment or the constant use of an emollient cream.

Callosities (Lat. *callus*). A callosity is a localised hyperkeratosis or thickening of the horny layers of the hands and feet due to friction.

Etiology Frequently *recurring* friction and pressure cause callosities. The horny patches on the hands are produced by the use of tools, those on the feet by badly-fitting boots, or orthopædic deformities. Slighter degrees of hyperkeratosis are seen on the fingers of players on stringed instruments, *e.g.*, harpists violinists.

Pathology The lesion is a hypertrophy of the corneous layer of the epidermis—a reaction to frequently repeated irritation.

Clinical features The callosity is a horny raised, flat plaque of a yellow or greyish colour As a rule there is no inflammation, but occasionally suppuration occurs. The hand lesions are painless but those on the soles may be tender and cause great discomfort in walking

Treatment is rarely required, except when they occur on the sole. If removal be called for the parts are soaked in hot water and pared down with a sharp knife The salicylic plaster (Leslie's) or salicylic collodion regularly applied will remove the horny layers. A single dose of 400–600 r of X-ray will often cure the condition, but preventive measures, such as the avoidance of ill-fitting shoes socks, etc., should be advised.

Clavus or corn. A corn is a small, circumscribed and painful over growth of the horny layer of the epidermis of the toes and soles, *i.e.*, a focal callosity

Etiology Friction and pressure from tight or badly fitting boots are the exciting cause but doubtless a predisposition exists in the skin.

Pathology The corneous layer is hypertrophied as in the callosity but here forms a horny plug composed of a conical mass of epidermal cells

whose apex projects deeply into the papillary layer elongating and narrowing the papillæ. The pressure of this horny plug causes the pain.

Whitfield states that corns only arise over subluxed joints which, by pressure, cause aneurysmal dilatation of papillary capillaries from which the hypertrophy arises

Clinical features Corns are round, flat elevations of the skin on the toes and soles They are often multiple. Except when they exist between the toes corns are hard and horny but in the interdigital spaces they are soft and whitish in colour from the maceration of the epidermis by warmth and moisture These interdigital lesions are sometimes warts and not true corns Whether hard or soft, they are painful and tender and in many instances variations in the temperature especially cold and damp cause spontaneous pain

Treatment After softening in hot water the hard corn may be pared down with a sharp knife and the conical plug removed with the point. A corn plaster a ring of thick plaster worn over the area to relieve the parts from pressure will often effect a cure Salicylic acid collodion (1 in 5) painted on for several nights followed by soaking in hot water often removes the hard corn

Soft corns may be pared down or treated with the salicylic collodion, the toes afterwards being kept apart by a pledget of cotton wool, powdered with 3 per cent salicylic acid in a base of zinc oxide and talc. The treatment of painful corns requires much patience and gentleness and the help of a registered chiropodist is invaluable. Pain is often relieved by X ray therapy in doses of 150–200 *r* through 1 mm. aluminium filter and not localised to the corn. After removal it is imperative that properly fitting boots and socks be worn, or the corns will recur Ingram gives a single unfiltered dose of X rays (1 000 *r*) exactly to the corn with good results

Feigned Eruptions Dermatitis artefacta

Dermatitis artefacta is the name applied to an eruption produced by the patient to excite sympathy or to evade work. In civil practice the subjects are usually hysterical girls and women, paupers and others desiring admission to hospitals and infirmaries, and workpeople anxious to obtain compensation under the Workmen's Compensation Act In the Services the eruption is produced by men who want to obtain their discharge A number of cases have been seen in men desiring to evade military service Ormsby is of opinion that in some of the so-called hysterical cases the acts are subconscious

The lesions are produced in a variety of ways sometimes by friction, scratching with the nails, etc and in other instances by the deliberate application of irritants, such as alkalies acids cantharides, phenol croton oil tobacco-juice and mustard. It is often very difficult to determine the means employed and the patient naturally uses every artifice to escape detection.

Clinical features. All varieties of dermatitis may occur the type depending upon the irritant employed Friction, scratching with the nail and with sharp instruments such as scissors cause abrasions and even

superficial ulcers. Deeper lesions are generally produced by caustics and acids. Sometimes the destruction is so great that virulent bacterial infection is suspected. The lesions are erythematous, bullous, ulcerating or even gangrenous.

They generally present features which strike an experienced eye at once, but occasionally it is extremely difficult to make a diagnosis. The points upon which stress should be laid are —

(1) The lesions do not conform to the known types of skin disease

(2) They are in parts which can be seen by the patient and reached by the patient's hands. The left side is more commonly affected than the right, owing to most people being right-handed.

(3) The lesions are remarkably circumscribed, the surrounding skin being normal. Their outline is often rectangular linear angular or circinate, while pathogenic lesions are rounded or ovoid.

(4) In the hysterical there are often changes in the field of vision, anæsthesia of the palate and of the stocking and glove areas, and occasionally hemianæsthesia may be demonstrated. These are probably induced suggestion phenomena.



Fig. 137 Dermatitis artefacta.

The photograph (Fig 137) illustrates an exceptional case. It shows the leg of a young girl in whom the lesions were remarkable for their arrangement in sets of three, all of the same length, and equidistant. They consisted of rather deep longitudinal abrasions covered with dried blood and small crusts formed by dry exudation. Recent lesions and the stains of older abrasions are well shown in the photograph. The patient had complete anæsthesia of the palate and right hemianæsthesia affecting the face, limbs and trunk, with the exception of a spot the size of a shilling over the right eyebrow where sensation was normal. It was suggested that the excoriations were produced by a three-pronged fork, but scratching by the finger nails might have caused them.

Another patient had ulcerative lesions on the right arm, probably produced by caustics. One ulcer the size of a half-crown was well defined and covered with dried blood Some of the smaller spots resembled vaccination lesions. Below these were areas of simple erythema. There was complete anæsthesia of the palate. The patient was twenty-six years of age She was an inmate of an inebriates home for the cure of the chlorodyne habit.

Occasionally patients tie ligatures round a limb producing chronic œdema or more serious changes.

An interesting case was a maternity nurse who produced blisters with liquor epispasticus on the right hand and fingers She had stocking and glove anæsthesia and was for a long time supposed to be suffering from syringomyelia. She gave the history that she had submitted to the removal of the nails on eighteen occasions for whitlow By covering the affected areas with an occlusive dressing and gradually increasing its size the blisters appeared higher and higher up the limb until the neck was reached By a ruse a small bottle labelled adrenalin and cocain was found in the patient's possession She insisted that she used this for hay asthma, but an examination of its contents proved it to be blistering fluid. She indignantly denied an association between the lesions and the cantharides

Plate 34 shows the breast of a young maidservant with characteristic lesions and numerous scars She presented the stigmata of hysteria The nature of the agent used was not discovered. It is interesting to note that she had had a laparotomy performed for supposed gastric ulcer

Napoli has shown that a bullous dermatitis was produced by Italian soldiers by the local application of the leaves of *Ranunculus acer* to the skin. The root of *Daphne gnidium* and juice of cactus leaves were also used (Caraccio) to simulate skin disease.

The acute ulcerations should be tested with litmus paper to detect the presence of strong acid or alkali

These cases are not uncommon and may give rise to great difficulty The patients are unreliable witnesses and they refuse to confess by what means the dermatitis is produced and they have been known to submit to extensive operation rather than acknowledge that the lesions were self inflicted Moreover it is often surprisingly difficult to get the patient's friends to believe that the physician is taking a correct view of the case One mother insinuated that Sequeira was in collusion with the dermatologists at two other general hospitals because he at once suggested the cause of her daughter's trouble She believed that her unfortunate child was the object of persecution on the part of the hospital doctors

Dr Dore has reported a case in which the patient was described by a mental expert as having a dual personality

A feature which is forcibly brought out in the histories of several cases, is that some slight traumatism a small burn or wound often appears to suggest auto-infliction of injuries to the patient. The worst type of malingerers seen in civil practice are those who have some dermatitis produced by their employment and continue to keep up the irritation The payment of five pounds to a servant employed in a large institution as compensation for dermatitis alleged to be caused by irritant soap and alkalies led to an epidemic of similar cases which came under our notice

Treatment Early recognition of the affection by the physician, the prescribing of some impressive local application and of a bromide and valerian mixture and an authoritative expression of opinion on prognosis may so impress the patient as to effect a cure without entering into any discussion as to the nature of the ill Simple protection of the lesions leads to their rapid healing but the patient, finding that she is the object of suspicion by one doctor may pass on to another In all cases removal

PLATE 84



[illegible] (Dermatitis Artefacta)

Right breast of [illegible] young girl with [illegible] produced lesions. She had symptoms of [illegible] and had had abdominal section performed for supposed gastric ulcer. No ulceration was found at the operation.

from the anxious care of credulous friends and relatives is important, and the discipline and routine of hospital often prove of great value.

Malingering should, of course, be exposed and treated as an offence. Hysterical cases, however call for careful handling. In many as shown by MacCormac, the phase is expressive of mental conflict, anxiety or agitation which will pass, causing the patient no harm and often being blotted out of her memory The improper handling of such cases though it may stop the dermatological manifestations of disorder may be responsible for more serious happenings. The approach to and handling of the problem of hysteria should be along the recognised lines of psychological practice and should generally be left to the expert in that branch of medicine.

DERMATOSES DUE TO COLD

The local changes met with as a result of exposure of the body or part of the body to intense cold are —(1) freezing of the soft parts, (2) changes in the vascular supply

Intense cold is used in the treatment of nævi, warts and the like by liquid air and by solid carbon dioxide The application of the freezing agent is followed by an immediate shrinking of the parts with the formation of a white pellicle In a few minutes the parts resume their natural size and appearance, and at the end of from two to six hours vesication and the formation of bullæ occur If the duration of freezing has been prolonged, and especially if pressure has been applied at the time, as with the solid stick of carbon dioxide, there may be superficial sloughing or ulceration which may take several days to some weeks to heal. If the application be not prolonged above thirty or forty seconds the resulting cicatrix is scarcely noticeable (see p. 750).

Frost Bite

Frost bite is caused by freezing of the superficial tissues The skin of an area, *e.g.*, an ear a finger or a toe, may be frozen hard and no ill effects may follow thawing More commonly after thawing the skin becomes red and swollen and covered with blebs containing clear serum later parts of the skin and deeper tissues may die and come away as a scale or a dry gangrenous mass. The extent of the damage depends on the duration of the cold and its intensity During the process of thawing the patient complains of intense pain, and when the pain dies away tingling and itching follow Healing is attended by an inflammatory reaction. The result of such lesions is great deformity if the nose or ears are affected. Histologically it is found that the affected cells are swollen and the superficial nerves are believed to degenerate Ulcerating lesions are treated on ordinary lines with antiseptic dressings. Surgical interference may be required.

Trench-Foot. Immersion Foot. Shelter Foot, etc.

Trench-foot is due to changes in the vascular supply After exposure to a less degree of cold over comparatively long periods, especially in damp

of thick boots and gloves and woollen stockings is important, and hot water must be used for washing

No best treatment for chilblain exists Erythema pernio is the outward sign of the inability of the skin, including its small blood vessels, to adapt itself to low temperatures The endocrine glands through the vegetative nervous system control the skin vessels which should compensate for loss of heat and therefore thyroid extract or polyglandular therapy may be the most successful line. For the same reasons sedatives are useful when emotional states disturb endocrine balance. Perhaps it is the toxic effect upon the same systems which occasionally makes septic or tuberculous foci of etiological importance. Calcium and its complement, vitamin D diminish the excitability of nerve endings and also retard the exudation which accounts for the œdema, tension and irritation thus the mineral, the vitamin or both together often have a rapid beneficial effect, but may fail completely for obvious reasons. Other vitamins, *e g* C nicotinic acid and P and K, appear to be essential to capillary function and avitaminosis is bound to be of etiological importance in chilblain. General ultra violet light by improving metabolism and making vitamin D in the skin is excellent therapy A high protein diet increases the metabolic rate and body heat and so is indicated with adequate minerals and protective foods. Massage, vigorous exercise and physiotherapy will improve the peripheral circulation and local heat loss must be prevented from dislocating local control by suitable clothing Emollients, antipruritics and mild counter irritants are the basis of local treatment which is the least important.



FIG 138 Livedo reticularis in an infant.

X rays in doses of 100–150 *r* often rapidly relieve the irritation and the acute congestion. Three doses may be given at intervals of one or two weeks to a total of 400 *r*

If the chilblain is broken the parts must be kept at rest and dressed with boric acid ointment or iod x Fomentations of boric lint are useful if there is ulceration and sloughing

Livedo reticularis Livedo annularis These names are given to a reticular or annular purplish mottling of the skin occurring in certain

subjects from exposure to cold. It is common in children who are otherwise quite healthy. In tuberculosis, syphilis, rheumatism, alcoholism and hypothyroidism the condition may become persistent and the discovery of the eruption should be followed by a careful examination for systemic disease. The eruption begins with erythema, the result of venous stasis, the pattern depending upon the anatomical distribution of the vessels in the skin (*vide* p. 6). In some cases a syphilitic or tuberculous eruption may take on a reticular pattern owing to antecedent livedo.

REFERENCE.—H. G. ADAMSON *British Journal of Dermatology* 1916, p [illegible]

Dermatitis hiemalis (Dühring). Dühring and Corlett have called attention to a form of recurrent winter eruption associated with high winds and cold weather in the Great Lake region of North America, which is rarely if ever observed in this country. The lesions are round or horseshoe-shaped raised patches with well-defined margins and of a dusky red colour. At first the red raised patches are covered with small vesicles and closely simulate herpes. The vesicles rupture leaving small denuded areas which weep. Later the lesions fade and are then covered with fine scales. In the late stage they somewhat resemble patches of lupus erythematosus, but have no tendency to peripheral extension. The backs of the hands and occasionally the feet are affected.

Histologically there are vascular dilatation and oedema and the formation of epidermal vesicles. Crusting may occur.

Treatment. Leather gloves are advised, and the hands should be kept dry. Diachylon ointment with three to ten grains of salicylic acid to the ounce is a suitable application.

RADIATION AND THE SKIN

Heat rays, light rays, ultra-violet rays, Grenz rays, X-rays and the emanation and rays given off by radium and radioactive elements, may all produce cutaneous changes. They are all subject to certain common laws. (1) The intensity of the irradiation varies inversely as the square of the distance of the source of the rays from the surface irradiated, provided that the source is small compared with the distance and that the natural divergence of the rays is not modified by lenses or reflectors. (2) Where the rays fall obliquely upon a surface the intensity is proportional to the cosine of the angle which the rays make with the normal to the irradiated surface with the exception of X-rays, for oblique rays which penetrate deeply have longer paths in the skin than the incident rays and therefore a higher percentage of the oblique rays is absorbed by the skin. Only those rays which are absorbed can produce physical and subsequently chemical and biological effects. The reflected or transmitted primary rays are without effect and this applies to all forms of radiation. To these Freund has added the following :—(3) The duration of the period of latency is in inverse proportion to the wave-lengths of the active rays, and the effect lasts longer in proportion as the wave-length is shorter and (4) the greater the intensity of the irradiation, the earlier the reaction and the longer it lasts. For instance the long heat waves produce an almost immediate effect on the skin, while the reaction to the ultra-violet rays, which are of shorter wave-length does not appear for several hours after the exposure. After exposure to the X rays in moderate dose there is no obvious effect for fourteen to twenty-one days, while if the dose be excessive a reaction may appear in a week or ten days.

DERMATOSES DUE TO HEAT

Heat, if sufficiently intense produces inflammation of the skin. The various degrees of burn do not require long consideration in this work, as they are fully dealt with in the text books of surgery The simplest is an erythema, which may speedily pass off with or without desquamation. The next degree is the elevation of the epidermis by serum to form bullæ or blisters The most extensive lesions of the second degree are seen in scalds In the third degree there is ulceration and lastly necrosis or sloughing of the skin

The results of burns and scalds are temporary pigmentation in the superficial cases, and permanent scars when the corium or the deeper structures are destroyed

Keloid the hypertrophic type of scar is very prone to develop upon the scars of burns so that prophylactic X ray or radium therapy should be given to recent scars on exposed surfaces (*vide* Keloid p 600)

Treatment of burns The erythematous lesions are treated with cooling lotions or creams.

Moist surfaces should be coagulated with tannic acid triple dye or a p nicillin powder but only for short periods on the face scalp, hands and about the joints lest atrophy or contractures develop. Cod liver oil 25 per cent. in pasta hydrarg ox flav is a suitable application, or dressings of tulle gras may be applied.

Occlusive elastic bandages are of value in the treatment of burns for by preventing lymph stasis they reduce the tendency to keloid formation.

Ulcerative and necrotic burns respond best to the envelope" technique which affords constant irrigation with saline and hypochlorite

It will be remembered that in the treatment of rheumatism dry heat of great intensity may be employed without producing a dermatitis. The same degree of heat in a moist atmosphere causes acute inflammation

Erythema ab igne Pigmentation due to Heat. Ephelis ab igne

In addition to the pigmentation left by a burn we frequently see a macular pigmented eruption due to exposure to heat. This is commonly on the front and inner aspects of the legs and occasionally on the forearms from the habit of toasting the limbs in front of the fire. The eruption begins as a coarsely reticulate erythema, and ends in pigmentation. The brown macules scattered over the surface produce a characteristic mottled appearance Sometimes a lichenisation and vesication occur In Fig 139 are shown the legs of a young woman with a marked degree of ephelis ab igne. Cooks and stokers suffer similarly The continued application of a hot water bottle may also cause the eruption

Microscopically there are changes of inflammatory type in the papillary and sub-papillary layers, especially around the vessels Pigment deposits are found in the basal cells of the mucous layer of the epidermis.

THE EFFECTS OF LIGHT ON THE SKIN

The exposure of the skin to strong sunlight or to an artificial illuminant which is rich in actinic rays produces local and general effects.

Local reactions to actinic light. These reactions are (1) an acute erythema which may pass on to vesication and even superficial ulceration, and (2) pigmentation.

The intensity of the reaction varies with the intensity and duration of the radiation and with artificial illuminants inversely as the square of the distance of the source of light provided that the source is small and that

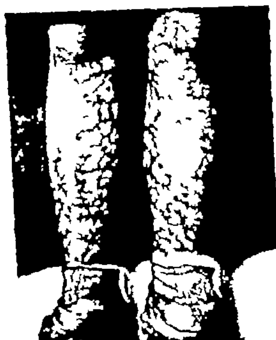


Fig. 180. Erythema (Ephelis) ab igne. Female, æt. 22.

the natural divergence of rays is not affected by reflectors. There is a wide range of reaction between different individuals to actinic light. As a rule, the reaction is more severe in blondes than in brunettes but pigmentation is more intense in darker subjects It would appear also that fluorescence of the skin, which is more marked when the integument is oily from excessive secretion of sebum and oily sweat, diminishes the sensibility

In the treatment of disease by light the sun's rays, the electric arc with carbon poles, mercury vapour tungsten and some compounds of tungsten are used The penetrative power of the highly actinic rays from tungsten is negligible and Finsen's work showed the necessity of blanching the skin to allow the rays of the violet end of the spectrum to pass through the skin. It has been shown, however that these radiations do not penetrate a normal skin for more than one millimetre

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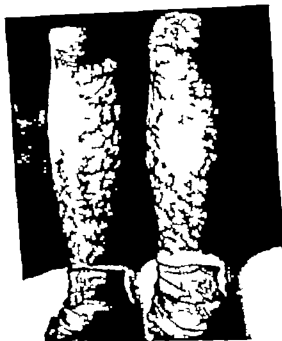


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Sensitisation of the skin to actinic light The local action of the actinic rays may be intensified

(*a*) By the application of certain fluorescent derivatives of coal tar, *e g* eosin erythrosin, to the skin. Ulceration instead of vesication can be produced by exposing an area of skin to the concentrated rays of a large carbon arc after the local injection of erythrosin

(*b*) By the intravenous injection of 0 2 c.c. of hæmato-porphyrin into himself Mayer Betz so sensitised his skin that the exposure of part of his right arm to the Finsen light caused sloughing

(*c*) By the experimental production of hæmato-porphyrinuria in animals by the administration of sulphonal Perutz found that a three minutes exposure of the ear of a rabbit to Kromayer s mercury vapour lamp produced vesication followed by scarring No such reaction occurred in controls

(*d*) By the ingestion of buckwheat (*Fagopyrum esculentum*) pigs and sheep and rarely cattle and goats become so sensitised that exposure to sunlight produces on the white areas of these animals an eruption which varies from erythema to vesication, ulceration and even gangrene The cutaneous manifestations are associated with pyrexia and other toxic symptoms Buckwheat contains phyto-porphyrin, which is closely related to hæmato porphyrin.

(*e*) Dermatitis produced by numerous vegetable irritants may render a surface hyper sensitive. It is suggested that such an affection be classed as phyto-photo-dermatitis (*vide* p 343) Some of the recently introduced synthetic drugs appear also to be sensitisers *e g.*, sulphonamides.

Solar Erythema. Sunburn

Solar erythema is common. It affects exposed parts and particularly the forehead, cheeks and nose In oarsmen wearing rowing costume the neck and upper part of the chest and the arms may also be acutely inflamed. An acute erysipelatous reaction of the feet and lower legs from paddling followed by exposure to the sun may present an alarming picture, and reckless sunbathing at the seaside or on cruises may cause serious ill health

The eruption occurs usually in the early summer before the skin has become bronzed by exposure to strong sunlight. The area affected is bright red hot and swollen and there is often considerable tenderness and smarting The eruption starts some hours after exposure to the sun and fades in a few hours to a few days and is followed usually by desquamation and later by pigmentation Fair people suffer more than brunettes and albinos most of all Severe reactions are seen in negro-albinos in the tropics Repeated reactions may end in cancer (Fig 141) Freund described an interesting case of a man who suffered from leucodermia on the face but who was otherwise dark After a long exposure to strong sunlight he developed an acute erythema solare on the white patches on his face while the normally dark pigmented parts were unaffected.

As an illustration that sunburn is not caused by heat rays it may be mentioned that climbers on the glaciers suffer from sunburn on the

lower part of the face (chiefly on the chin and on the under surface of the nose) from light reflected from masses of ice and snow

A similar dermatitis occurs in workers in electric furnaces when the affection may be more severe, passing on to the stage of blistering from subcorneous effusion of plasma

The treatment of solar eyrthema consists in the application of soothing lotions and creams, such as the lotio calaminae or the linimentum calaminae or a cream containing ung sulphuris dr i., ung zinci (1914) ad oz. 1 Susceptible persons can avoid the acute effects by protecting the face with veils (red or brown) or by applying pigments in the form of powders or salves. Tannic acid, quinine or ichthyol in creams or lotions may be applied to protect the skin, since they are to some extent opaque to actinic rays.

Pigmentation from the Actinic Rays of Light. Lentigo Ephelis Freckle

Lentigines are yellowish brown to black pigment spots occurring on the face and elsewhere as the result of exposure to the actinic rays of light.



FIG. 140. Permanent freckles. The hands were also affected.

Pathology Freckles are circumscribed patches of pigment in the basal layers of the epidermis.

Clinical features. Freckles are rounded or irregular yellowish brown

to blackish spots varying in size from a pin's head to a lentil seed, rarely larger occurring on the face, neck and the backs of the hands and wrists. They may occasionally occur on the trunk and are usually multiple They are commonest in children and adolescents, blondes and especially red-haired subjects suffering most Ephelides appear during the summer and fade sometimes completely in the winter

Prognosis They may disappear under treatment but tend to recur

Treatment Some freckles may be removed by causing exfoliation of the epidermis Pure carbolic acid, or perchloride of mercury three or four grains to the ounce in glycerine or spirit applied two or three times a day will remove them if continued until the parts become red, when a little zinc ointment or cream should be applied It is wise to begin with a weak solution. *Red or brown veils may be worn as a protective by those* specially liable to freckles

Occasionally **freckles** are **permanent.** In the patient depicted here (Fig 140) they were in enormous numbers on the face neck and on the back of the hands and caused great disfigurement. They were darker in the summer than in the winter but fresh spots occurred during the sunny months every year and it was asserted that none had ever disappeared. The patient otherwise in perfect health, had been affected for several years There was no atrophy of the skin, and no telangiectases or warts appeared so that xeroderma pigmentosa was excluded Less severe cases are not uncommon.

Pigmentary and Atrophic Dermatoses due to Light. Chronic actinic dermatitis, Solar Epitheliomatosis

Xeroderma pigmentosa characterised by permanent freckling from exposure to light with atrophy of the skin, telangiectases, pigmented warts and malignant tumours, has been considered elsewhere (p. 73).

Sequeira had under his care a man, aged 35 years of age who worked in the fields and who since puberty had suffered from an increasing freckling with atrophy of the skin, warty growths and epitheliomata He was *in hospital several summers in succession for the removal* of tumours which were characteristic epitheliomata. The condition was identical with xeroderma pigmentosa but began later in life

Chronic actinic dermatitis *Tropical skin* Persons who have lived long in the tropics present a condition of the skin of the backs of the hands and on the face and neck characterised by atrophy and pigmentation with a degree of hyperkeratosis and the development of warty excrescences resembling those of xeroderma pigmentosa these keratoses are potentially *malignant Paul found similar changes* common in Australia and warned against excessive sun bathing The name cutis rhomboidalis nuchae is given to the thickened creased skin at the nape

The *seaman's skin* described by Unna is possibly in part *due to the* influence of the actinic rays It is characterised by the formation of warty growths which become epitheliomatous The many cases seen in bargees suggest that tar and creosote in ropes and timber may be factors of etiological importance

The *senile skin* is *atrophic and often pigmented*, and keratomata are

common In some cases the warty growths become malignant. It is possible that this condition also may in part depend upon irritation by light (*vide* Fig 141)

Berlocke dermatitis. Dermatitis pigmentaria is the term given to the pale or deep brown pigmentation of the skin produced by the action of sunshine and heat upon areas of skin sensitised by the application of eau-de-Cologne or other perfumes containing oil of bergamot. An erythematous reaction may or may not precede the pigmentation.

Chloasma bronzinum, Tropical mask (Castle), occurs in Europeans and also in natives in many tropical countries. Part of the face or neck and chest is peculiarly pigmented. The pigmented areas slowly increase, and on the face produce an appearance like a bronze mask. It is incurable while the patient remains in the tropics. Sunlight appears to be the cause The mucous membranes are unaffected.

Actinic urticaria. Very occasionally a marked urticarial reaction results from the slightest exposure to light, and Ingram remembers one young woman who had been subject to this most of her life. She lived and worked away from the light by day and took all her exercise after sundown.

REFERENCE—*Journ. Invest Dermat.*, 1946, vii, No. 2, p 99.



FIG. 141 Rapidly-growing cancer following repeated sunburn in a negro albino.

Summer Eruptions

There is a group of rather uncommon conditions which demand attention in this place as being in all probability due to the irritant effects of light on peculiarly sensitive skins. To this group the term "summer eruptions" is best applied, for there are several degrees which have been described by different observers under several names. The actinic rays are the exciting cause but the reaction appears to depend on sensitising bodies circulating in the blood (*vide* p. 208). These eruptions appear from February to October but may relapse with bright sunny days during the winter especially after snowfalls.

The least severe form is Actinic Dermatitis of which Hutchinson's summer prurigo is an example while the more acute forms have been called "Recurrent summer eruption" by Hutchinson, Hydroa vacciniforme (Bazin), and Hydroa puerorum (Unna)

Actinic dermatitis is not uncommon and arises in early or adult life. It starts as a simple sensitisation eczema and develops later into an infiltrated lichenification and prurigo. It may eventually persist throughout the year Histology shows an intense round cell infiltration in the corium not found in simple lichenification. The condition may closely resemble lupus erythematosus to which it is related.

Hutchinson's summer prurigo (Lat. *prurigo* itching) is a papulo-

to blackish spots, varying in size from a pin's head to a lentil seed, rarely larger occurring on the face, neck, and the backs of the hands and wrists. They may occasionally occur on the trunk and are usually multiple. They are commonest in children and adolescents blondes and especially red haired subjects suffering most. Ephelides appear during the summer and fade sometimes completely in the winter

Prognosis. They may disappear under treatment but tend to recur

Treatment. Some freckles may be removed by causing exfoliation of the epidermis Pure carbolic acid or perchloride of mercury three or four grains to the ounce, in glycerine or spirit applied two or three times a day will remove them if continued until the parts become red, when a little zinc ointment or cream should be applied. It is wise to begin with a weak solution. Red or brown veils may be worn as a protective by those specially liable to freckles

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PLATE 35



BULLOUS SUMMER ERUPTION

Girl aged six. The vesicles and bullae recur year by year in the summer months. The lesions leave scars, many of which are seen in the illustration.

vesicular eruption occurring in infancy and childhood and persisting to adult life It is rare for it to commence after puberty

The eruption appears in summer and the patient may be free or nearly so during the winter But there are some almost identical cases which depend on exposure to cold and wind.

Both sexes are affected, the earliest lesions appearing in infancy and recurrences occur summer by summer up to adult life

The face, neck and upper extremities are affected but occasionally the whole surface may be involved with the exception of the flexures and the palms and soles

The lesions consist of rounded papules of a pale red colour sometimes as much as an eighth of an inch across Each papule may be capped by a tiny vesicle. In rare cases pustulation occurs. The lesions itch at night and the tops may be scratched off by the patient, causing small blood crusts to form In some cases urticarial wheals occur The lesions are always discrete

Summer prurigo has to be diagnosed from other itching papular eruptions and from the more severe conditions to be immediately described. The history of the first appearance in early childhood and the periodical recurrences in the summer are usually sufficient to make a diagnosis from other pruriginous eruptions.

Hydroa aestivale (Gk *hudor* water Lat. *aestivus* summer). Recurrent summer eruption (Hutchinson) Hydroa vacciniforme (Bazin), Hydroa puerorum (Unna)

A recurrent summer eruption of children characterised by vesication which leaves scars

Etiology Sex has no influence, although most of the early cases described occurred in boys, hence the name Hydroa puerorum. The disease as a rule begins in childhood and is occasionally found in more than one member of a family Sunlight is the exciting cause and in a number of cases the eruption is associated with hæmato-porphyrinuria.

Clinical features During the first two or three years of life rarely later an eruption appears on exposed parts in the summer It is often preceded by a sensation of heat and pain and some general malaise Itching is uncommon. The elementary lesions are red spots, on which develop one or more small vesicles The vesicles usually coalesce to form small flat blebs which dry up in three or four days into scabs or crusts. In other cases umbilicated vacciniform lesions develop which gradually dry up with the formation of scabs To this type Bazin gave the name of Hydroa vacciniforme In all cases the separation of the scab leaves a depressed red spot, which ultimately forms a white depressed scar (Plate 35) An attack lasts for two or three weeks the vesicles coming out in crops

The cheeks, nose, ears, neck and the backs of the hands are the parts most commonly affected but in some rare cases the eruption may be more widely spread. The attacks recur yearly in the summer or early autumn, but as puberty is approached they become less acute and cease when adult life is reached. A pink staining of the milk teeth due to blood pigment and deep pigmentation of bone, as shown by radiographs, were observed in a congenital case described by Mackey and Garrod

Diagnosis. Hydroa æstivale has to be distinguished from other scar leaving eruptions, particularly the tuberculides, lupus erythematosus and syphilis. The symmetry of the eruption, its distribution on parts exposed to light and above all the history of its recurrence every summer from early infancy should make the diagnosis easy

Prognosis. With adequate care and protection much relief can be obtained.

Treatment of summer eruptions. The patient should be protected from light by wearing broad brimmed hats, high-necked frocks, long sleeves, gloves, etc., and protective cosmetic applications.

Local sepsis about the nose and throat and gastro-intestinal abnormalities should be considered as possible sensitising factors. Locally tannic acid 2 to 10 per cent. or quinine hydrochlor 2 to 4 per cent. or ichthyol 2 to 4 per cent. in calamine lotion or in pellanthum (a non-greasy calamine cream) or in a cold cream base are helpful, or the patient may use a mechanical protection as Cover Mark These must, of course, be applied before the patient leaves his or her bedroom each day Fluorescein, 0·5 per cent. in olive oil, is useful in the tropics. Yellow vaselin is effective.

Fractional doses of X-rays relieve irritation and clear or control the eruption each season until the phase of sensitiveness passes. Intravenous or intramuscular injections of gold in small doses sometimes cure the condition temporarily or permanently Arsenic, quinine and belladonna have been advocated but are of doubtful value.

EFFECTS OF RÖNTGEN OR X RAYS ON THE SKIN

The discovery by Röntgen of Würzburg of the special properties of the rays given off by a Crookes tube led to their being widely used for diagnostic purposes. It was early noticed that the radiations caused a *falling* of the hair and Freund and Schiff were led to apply them for the treatment of an extensive hairy mole. The changes which they found were produced in the skin led to a still further advance. The rays began to be used for therapeutic purposes and they now play an important part in the treatment of cutaneous disease. At first the application of the rays was purely empirical, frequent sittings of short duration being given until some obvious change was noticed in the integument. Later Holtzknecht and Kienbock in Vienna, and Sabouraud and Noiré in Paris, and numerous other workers, developed methods of measuring with some degree of accuracy the quantity of rays given off by the X ray tube. The rays are of varying quality according to their wave-lengths, and a whole spectrum of radiations of different therapeutic value is produced. We are able to eliminate the softer rays by appropriate filters, and this procedure is of great value in the treatment of the deeper lesions (p. 761).

The X-rays produce profound modifications in the structure of the skin and muscle, but the effects are most marked upon the cells of diseased tissue for instance the cells of a rodent ulcer and some granulomata undergo profound alteration before the normal cells of the epidermis are affected. But in larger doses the rays will cause the destruction of the normal element of the skin and even of the subcutaneous tissue. The quality and especially the penetrating power of the rays vary considerably

PLATE 30



X-RAY DERMATITIS

SCARRING AND PIGMENTATION CAUSED BY PROLONGED X-RAY TREATMENT

The skin is atrophic and pigmented and there are numerous telangiectases. These extend far beyond the pigmented area. The rays were applied for tuberculous glands. There was a small patch of lupus erythematosus on the nose.

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Fractional doses of X rays relieve irritation and clear or control the eruption each season until the phase of sensitiveness passes Intravenous or intramuscular injections of gold in small doses sometimes cure the condition temporarily or permanently Arsenic, quinine and belladonna have been advocated but are of doubtful value.

EFFECTS OF RÖNTGEN OR X RAYS ON THE SKIN

The discovery by Röntgen of Wurzburg of the special properties of the rays given off by a Crookes tube led to their being widely used for diagnostic purposes. It was early noticed that the radiations caused a falling of the hair and Freund and Schiff were led to apply them for the treatment of an extensive hairy mole. The changes which they found were produced in the skin led to a still further advance. The rays began to be used for therapeutic purposes and they now play an important part in the treatment of cutaneous disease. At first the application of the rays was purely empirical, frequent sittings of short duration being given until some obvious change was noticed in the integument. Later Holtzknecht and Kienbock in Vienna, and Sabouraud and Noiré in Paris, and numerous other workers, developed methods of measuring with some degree of accuracy the quantity of rays given off by the X-ray tube. The rays are of varying quality according to their wave-lengths, and a whole spectrum of radiations of different therapeutic value is produced. We are able to eliminate the softer rays by appropriate filters and this procedure is of great value in the treatment of the deeper lesions (p. 761).

The X-rays produce profound modifications in the structure of the skin and muscle, but the effects are most marked upon the cells of diseased tissue for instance the cells of a rodent ulcer and some granulomata undergo profound alteration before the normal cells of the epidermis are affected. But in larger doses the rays will cause the destruction of the normal elements of the skin and even of the subcutaneous tissue. The quality and especially the penetrating power of the rays vary considerably

with the wave-length the shorter the wave-length, the harder or the more penetrating are the rays

Small doses of X rays usually produce no visible effects upon the skin, although exceptionally an early transitory erythema has been noted, and in dark subjects pigmentation may increase in the treated areas. It is now established that no harmful effects ensue from sub-erythema doses, even when repeated according to the usual practice Such doses undoubtedly influence physiological and pathological processes although how they do so is not clear Their psychological value in chronic disease has probably been under rated.

The epilation dose is usually taken as 4/5ths of the erythema dose (350 to 450 r at 75 to 90 K V) and in the case of the scalp erythema rarely develops although it is now known that some areas of overlap receive as much as 70 per cent more than the planned dose to each area.

The dose was formerly estimated by the pastille of Sabouraud and Noiré a small disc covered with an emulsion of platino-cyanide of barium in collodion acetate of starch The pastille was placed midway between the anti-cathode of the tube and the area irradiated When a dose of X rays sufficient to turn the pastille from a pale green to a sepia colour (tint B) was administered (350 to 450 r) the hair follicles were affected, and at the end of a fortnight to three weeks the hair fell At the end of six weeks to two months the bald area began to be covered with a fine down which a few weeks later took on its normal character (see Appendix, Physiotherapy in Dermatology p 755)

Many dermatologists have now abandoned the pastille and adopted a type of dosimeter—as the Hammer dosimeter—whereby the dosage is measured in r units by the radiation passing through an ionisation chamber placed upon the skin which is being treated and within the field of radiation This is a more accurate method of measuring dosage and the erythema dose with the Hammer dosimeter is approximately 450 r units. Fractional doses are calculated accordingly but it may be taken that the equivalents of the old ½ B pastille dose is 200 r ⅓ B 150 r and ¼ B 100 r approximately Goldsmith has shown that there is considerable variation in the dose necessary to produce an erythema in different individuals—ranging from 350 to 470 r

If the erythema dose is exceeded the skin becomes red at the end of a fortnight, perhaps a little earlier epilation occurs, and there is a possibility that the hair will not grow again.

X-ray burn This reaction constitutes the first degree of an X ray burn and while being a warning of danger nothing more serious than some desquamation and temporary pigmentation may result. In the second degree of reaction to a larger dose of X rays the erythema appears earlier is more intense and the skin is hot and œdematous Vesication may develop by the tenth day the hair follicles sweat and sebaceous glands are destroyed or permanently inhibited so that although the skin heals in two to three months some late results are inevitable In the third degree the reaction is earlier still The epidermis is destroyed and ulceration may be present by the tenth day

The Röntgen ulcer is very painful indolent and covered with a yellowish adherent slough, like a diphtheritic membrane It may take many weeks

to heal. When very large doses have been given, deep necrosis occurs and the ulcer produced may never heal except after excision and skin graft. This reaction constitutes the fourth degree of severity of an X-ray burn.

It is obvious from the observations already made that frequently repeated doses have a cumulative effect, and repeated exposure without measurement caused some of the troublesome early results. When doses of 200 r (½ B) or more are administered, an interval of at least *three weeks* should elapse between one application and the next, and a course of treatment for benign lesions should rarely exceed three sittings and there should be an interval of *at least three months* between the courses.

An important late result of X-ray dermatitis is the formation of telangiectases in the scar. These may not appear for several weeks to some months or years after the exposure to the rays, and without any dermatitis if repeated exposures have been made. They may occur after an erythema, but are most common after superficial ulceration. In addition to the telangiectases, the X-ray scar is pigmented and atrophic. Plate 56 illustrates the pigmentation, atrophy and telangiectases left after dermatitis induced by many exposures for the reduction of tuberculous glands. Similar telangiectases occur after prolonged application of radium without filtration and occasionally are seen after treatment with the mercury vapour lamp of Kromayer.

X-ray dermatitis or necrosis may recur after a long interval. Darier described a case in which twenty exposures were made twelve years before for a supposed mammary cancer. The superficial dermatitis which followed healed. Eleven years and a half later the patient had an extremely obstinate ulcerative dermatitis. Sections showed excessive cornification, degeneration of the epidermis and papillæ and fibrosis of the papillary layer with marked dilatations of the vessels in the corium. We have seen epithelioma develop as the result of an acute X-ray burn as well as after chronic Röntgen dermatitis.

When it is necessary to apply the X-rays in the treatment of deep-seated tumours, enlarged glands, or hypertrophy of the spleen, the epidermis is protected from the soft rays by thin sheets of aluminium, from 1 to 4 millimetres thick. Silver and copper filters are also used.

Treatment of acute X-ray burns. In the erythematous stage nothing more is required than a soothing application such as ung. zinc. oxid., vaseline ointment, or liniment of calamine or ol. morrhuæ, 25 per cent. in zinc paste. Provided ulceration be not too deep cicatrisation usually occurs, though perhaps only after several months treatment. Such an ulcer is prone to break down even after complete healing and there are often subjective symptoms in it for months and even years, the patient complaining of itching tingling and other forms of irritation. Often there is intense pain at first, with neuralgic twinges, which may radiate from the ulcer. Where there is deep sloughing and the locality of the ulcer permits, excision with grafting may be practised with advantage.

Frequent repetition of small doses of the X-rays produces a condition which may pass on to epithelioma; such a disastrous result has followed the prolonged treatment of some forms of lupus by the rays. Sequeira saw a patient who had had 1 000 sittings under the rays for lupus vulgaris. Here an epithelioma developed upon the cicatrix produced by the treat

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appears to favour radio-necrosis All forms of soothing applications have been tried. Bland ointments containing cod liver oil are usually well tolerated.

Surgical interference should be avoided as long as possible We have seen several cases in which the removal of an affected nail appeared to start an acute destructive process. Even the removal of a slough appears to be harmful. With rest and time many of the worst cases tend to heal with atrophy and that is the best that can be hoped for The keratomata are

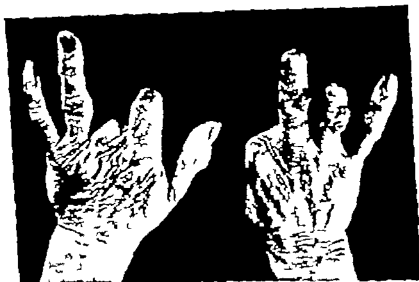


FIG. 142. X-ray dermatitis of the operator The hands of pioneer worker

best treated by radium, but should epithelioma develop, excision or diathermy is necessary

REFERENCES.—W. N. GOLDSMITH, Recent Advances in Dermatology S. C. SHANKS, *Brit. Journ. Derm. and Syph.*, 1938, 50 440. E. H. MOLESWORTH and H. L. BROOK, *ibid.*, 1938, 50, 421.

The effects of Grenz rays on the skin (Bucky rays) These rays are "very soft" compared with X-rays since they are produced by a high tension of about 10 000 volts, and they can only escape from the X-ray tube when a special window of lithium-borate glass is provided. So their penetration of the skin is very limited and it is estimated that the hair papillæ receive only about 1 per cent. of the surface intensity As with other forms of radiation, erythema is the first visible reaction and after small doses may not appear for several days but with larger doses (2,000 r or more) an erythema may occur within twenty-four hours. Some increase in pigmentation may occur without erythema with very small doses and is usually marked after an erythema has subsided. Very large doses (4 000 r or more) may produce an oedematous reaction with vesicles

ment. In another case the patient had had 300 applications of the rays, and here again cancer developed Norman Walker and others have reported similar cases A patient who had been under X rays for rodent ulcer several times a week for *twelve* years developed an incurable Röntgen ulcer and epithelioma followed.

X ray dermatitis of the operator The early workers with the X-rays were ignorant of the dangers which attend their use It was a common practice to hold the hand in front of the X ray tube to determine by a fluorescent screen the penetrative power of the rays emitted. In screen examinations too, the backs of the fingers of the operator were usually exposed to the rays. The result of these repeated exposures for short periods was an intractable X ray dermatitis with exceedingly tender and painful chronic ulceration followed by atrophic scarring and telangiectases. The ulcers were usually irregular tracts along the backs of the fingers, the base being covered with a yellowish white adherent slough. The margins of the ulcer were slightly tumid and bright red and there might be swelling and redness of the whole finger or even the back of the hand. The nails always suffered in the slighter degrees an excessive brittleness was first noticed later painful onychia occurred with destruction and separation of the nail In some cases the phalanges had undergone partial absorption and the atrophy of the skin and subcutaneous tissue lead to grave deformity Unfortunately this chronic and painful affection was not the only or the most serious part of the trouble for warty nodules appeared on the affected skin and eventually became epitheliomatous, necessitating amputation of fingers or parts of the limbs. In a few instances the face had been affected and we have seen multiple carcinomata on the trunk Many of the pioneer X ray workers died from malignant disease.

With the use of protective shields and the recognition of the dangers, the risks have been eliminated and no X ray worker should now be liable to this terrible affection. He should control treatment from outside a lead lined cubicle with lead glass window

There is still the risk of general debility and of sterilisation from scattered secondary radiations coming off the patient if operators are not careful and the wide use of X rays in medicine and in industry to-day makes this warning very necessary

The recommendations of the National Physical Laboratory that all X ray operators should have regular periodic medical overhaul and blood examinations, that they should work only thirty two hours a week and have four weeks holiday each year should be strictly observed

Pigmented spots appear on the hands, forearms, and elsewhere in X-ray workers A spot of black pigment the size of a threepenny piece developed with remarkable rapidity on the palm of an assistant at the London Hospital For fear of malignancy it was immediately excised

The lesions of chronic X ray dermatitis are always worse in the cold weather and even when quite soundly healed they tend to break down into ulcers in the winter

Treatment. The sufferer should, of course, be removed from work in which he is exposed to the rays and the affected limb should be kept at rest in a sling In our experience fomentation should be avoided as it

CHAPTER XVII

DERMATOSES DUE TO CHEMICAL IRRITANTS

Occupational Diseases of the Skin—Contact Dermatitis from Plants and Drugs

In practice by far the most frequent cause of inflammation of the skin due to chemicals is found in the processes of industry. Gardiner was able to trace at least 66 per cent. of all cases of dermatitis to this cause, and our own experience shows that this figure does not exaggerate its



FIG. 143. Fur-dye dermatitis.

importance. This subject is of such magnitude as to demand special attention, and is dealt with in a subsequent section (pp. 328 and 347).

It is, however, important to remember that, apart from manufacturing processes, chemical irritants cause dermatitis under conditions which may be easily overlooked. It will therefore be useful to review some of the more common forms met with in hospital and private practice.

(1) **Dyes.** The use of aniline and other dyes for clothing is a common cause of dermatitis (*Dyed Fur Dermatitis*). Para phenylenediamine is

or bullæ, but the dermis escapes and complete healing occurs, although slight atrophy and some telangiectasis may develop some years later

The Effects of Radiations from Radioactive Substances

Alpha rays are not rays in the ordinary sense of the word, but are particulate, consisting of the nucleus of helium carrying positive electrical charges These minute projectiles are shot from atomic orbits of radium, radon and thorium X with velocities up to 10 000 miles a second. They are readily absorbed by thin paper so that they do not emerge from the ordinary radium appliances used in medicine. They can of course affect tissues when derived from radon in solution or wax, but here the beta particles are of more importance and alpha ray therapy is practically confined to techniques with thorium X. If a solution of thorium X containing 1–2 000 electrostatic units per cubic centimetre is painted upon the skin an erythema appears within a few days, and with the stronger solution within twenty four hours Vesication is a very rare phenomenon, and usually a slight desquamation and various degrees of pigmentation are the only sequelæ of the erythema and thus thorium X is a safe method of radiotherapy but its usefulness is limited to very superficial lesions of the skin (p 769)

Beta rays are somewhat analogous to alpha rays in being minute projectiles consisting of electrons moving at velocities sometimes approaching that of light or X rays The electrons produced in X ray tubes do not approach these high velocities and are unable to emerge from the apparatus, so that in therapy beta rays are derived from radium plates which are thinly screened or from radon in glass tubes or in solution or wax It is these rays that are used in the treatment of superficial malignant lesions with radium plates and it is obvious therefore that they have a much greater power of penetration than the alpha particles Small doses are followed by an erythema and subsequent mild pigmentation. Larger doses may produce vesication or ulceration totally destroying the epidermis and resulting in slow healing painful superficial ulcers and atrophic scars which are very prone to the development of telangiectases later We have found it very difficult to influence port wine marks with beta ray therapy without producing obvious atrophy and the method is not recommended (p 767)

The **gamma rays** of radium are essentially of the same nature as X rays but have much shorter wave lengths and therefore have a greater power of penetration. The results of burns with large doses of gamma rays are identical with those produced by corresponding doses of X rays and the sequelæ are also identical (pp 314 and 765)

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probably the most irritant of these This substance (and derivatives of the same) has been largely used in dyeing coney skins to imitate beaver and mole fur for the collars and cuffs of winter coats. Women are the most frequent sufferers, the irritant causing an acute dermatitis, with erythema, œdema, vesication and crusting involving the neck and lower part of the face. Furriers and tailors engaged in making up these garments are affected on the hands Idiosyncrasy to the irritant is undoubtedly an important factor but many cases have been seen of recent years (Fig 143)



Fig 144 Hair-dye dermatitis.

and H E. Cox presented his experience in the chemical examination of furs in relation to dermatitis in *The Analyst*, of December 1933

Hair dyes made from para phenylenediamine and related chemicals, are also the cause of an acute dermatitis of the scalp, face and neck, often attended with considerable œdema, vesication and crusting Here again, certain individuals are predisposed to the irritant. Ingram patch tested 1 000 persons not previously exposed, to a 1 per cent solution of para and meta phenylenediamine and found approximately 4 per cent susceptible Some persons become sensitive after frequent usage while in others immunity persists for years

Face powders containing orris root are sometimes irritant For this reason *orris root* has largely been abandoned but occasional cases of face

powder dermatitis are seen, usually from the perfumes added. Other cosmetics as lipstick, eye-shadow eyelash varnish, nail polishes, cuticle solvents, etc., provoke dermatitis. Often the cause is obvious to the patient and medical advice is not sought, but difficulty may arise if the cheek chin or upper eyelids be affected by contact with varnished finger nails. Lipstick dermatitis is commonly due to the eosin, erythrosin rhodamin or tolu-safranin employed, all of which are believed to increase



FIG. 145 Dermatitis (contact). Fabric dye.

photo-sensitivity Deodorants, astringents and depilatories employed generally about the axillae or face may be a source of trouble.

REFERENCES—CARLETON, ALICE. "Cosmetics." *Brit. Med. Jour* 1932, 1, 999 A. SEZARY Cheilite du rouge. *Bulletin de la Soc. franç. de Derm. et de Syph.*, 1934, 422. The New York Board of Health put [illegible] ban on the manufacture sale and use in beauty parlours" of dyes known to cause harmful results.

Fabric dyes in frocks khaki shirts, socks, stockings and clothing occasionally give rise to dermatitis in those showing an idiosyncrasy Many dyes employed are more fat soluble than was previously the case, and this may account for the increased incidence of such troubles.

Various dressings in new clothing and substances used to prevent

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idiosyncrasy or acquired hypersensitivity Idiosyncrasy may account for eruptions arising from practically any external cause and the most unlikely possibilities should not be dismissed without patch-test investigation.

The patch-test is a standard investigation of the greatest value and should never be neglected especially in industrial or medico-legal cases. A small portion of the suspected agent is applied to the unaffected skin (generally the upper arm). It should be moistened, covered with cellophane or lint and should be fixed in position by strapping (as elastoplast) and left for twenty-four hours. If in solution, a small portion of lint, 1 inch square may be saturated and applied in similar fashion. At the same time a control test with a piece of moistened lint—or any other chosen control—is applied. If the suspected agent is the cause of the trouble it will naturally provoke a reaction at the site of application of the same size and shape as the test and this is recorded as a positive reaction. The site should be examined again at twenty four forty-eight and seventy

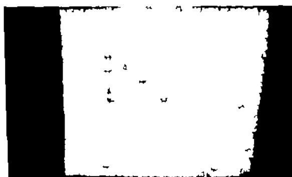


FIG. 147 Positive Patch-test reaction.

two hour intervals. Such reaction may spread locally may excite the original trouble afresh or may possibly give rise to eruptions elsewhere, but in our experience this rarely occurs and then only with a few particular chemical irritants. This argument is occasionally employed in law courts to justify a refusal to be investigated, but in our opinion it should not be upheld. The common sense and discretion of the investigator are called for in such cases the application can, for instance, be made for a very short period of time and can be constantly watched for discomfort or reaction.

Occasionally a reaction is delayed, but not if the patient has recently suffered from dermatitis. Tests should not be made while a patient is suffering from an acute attack of dermatitis or the mere application of an occlusive dressing may give rise to a reaction of the eczematous pattern.

Occupational Diseases of the Skin

Professional and trade dermatitis. It is difficult to classify the affections of the skin caused by occupations, because in modern conditions the processes of manufacture are highly complicated. Occupational diseases of the skin may be in the nature of traumatic dermatitis from gross chemical

creasing of garments may give rise to dermatitis and D D T in serum dress accounted for some cases

Suspenders sometimes provoke dermatitis from sensitiveness to nickel or rubber Necklaces bracelets wristbands, watches, earrings and similar adornments may likewise cause trouble. We have seen cases of dermatitis from dress protectors and rubber belts, spectacles, hatbands, gloves, boots, etc. and even from the celluloid of motor car steering wheels

Boots. The dyeing of cheap brown boots with aurantia was at one time a common cause of dermatitis and in some countries its use is prohibited by law

Hatbands made of imitation leather or dyed with chrome and aniline



FIG. 140 Suspender dermatitis (Patch test).

dyes have also been shown to cause inflammation of the skin of the forehead, but dermatitis from this cause is very rare

(2) **Photographic chemicals** must not be forgotten as a cause of dermatitis in the amateur (*vide* p 335) We have seen several cases from metol and other reagents in persons who develop their own films

(3) **Match-box dermatitis** due to the addition of the sesquisulphide to ordinary amorphous phosphorus was rather common in certain countries during the 1914-18 War The dermatitis occurred on the upper part of the thigh from contact with match boxes carried in the trousers pocket.

(4) **Plant dermatitis** in the amateur gardener may be overlooked. The special features are described on p 339

(5) **Lac dermatitis** from contact with *Mah-jongg* sets has been reported on several occasions The irritant is a non volatile body derived from *Rhus vernicifera* (*vide* p 342)

(6) **Vulcanite dermatitis** occurs in the ears in some telephone operators and occasionally from headphones used in "listening in "

These are examples of *contact dermatitis* arising either through

vesicles may or may not rupture, but their rupture is followed by oozing of plasma, producing a condition which may be called "eczematous." Such an eruption may spread beyond the area irritated. In some varieties the vesication is of the pompholyx type. The vesicles are tense and very closely set and often coalesce to form large blebs. In many cases the raw surfaces produced by the irritant dermatitis become infected with pyogenic organisms and the area becomes impetiginised (*vide* p. 444).

The inflammation in most subjects tends to subside on the removal of



FIG. 148. Erythemato-vesicular dermatitis (soda-water).

the source of irritation, the weeping areas dry up some scaling appears and ultimately the tissues are restored to their normal condition. The nails often suffer in trade dermatitis, and the staining produced by dyes, etc., often gives useful assistance in diagnosis They are often very brittle, or separate from the matrix, and sometimes show fissures and pits.

Hyperkeratosis and fissures. In other conditions the epidermis becomes thickened and horny as a result of the chronic irritation and the thickened horny layer cracks, producing fissures which are exceedingly painful.

Folliculitis, often of a suppurative acneiform type, is produced by the mineral oils (Fig 157). Irritating dusts tar pitch, bakelite, resins and chlorine compounds give rise to dry acneiform eruptions

Ulceration is produced by some irritants, *e.g.*, chrome, lime and arsenic In some instances not only is the skin affected but also the nasal septum, where perforation may result from the local irritation of the chemical in powder form.

or other irritants or in the nature of eczematous dermatitis resulting either from wear and tear of the skin from long-continued exposure to minor injury or from allergic sensitiveness (contact dermatitis) to one or more external agents with which the workman comes into contact.

Certain specific ulcerative atrophic and cancerous changes result from particular occupations especially those involving contact with chrome, lime tar and X radiations In investigating a suspected case it is of the utmost *importance to find out exactly what the employee does.* For instance he may say that he works in a particular trade but on close inquiry it is found that his duty is to use alkalies or turpentine to clean utensils used by the regular workers He may be employed in a steam bakery looking after machinery as an engineer and so come in contact with *dirty mineral oil If one were not careful in learning exactly what kind of* work this man performed he would be classed wrongly and preventive measures would not be taken.

Occupational diseases of the skin may be due to —

(1) Direct chemical irritants such as the chrome compounds, arsenic coal tar derivatives, aniline dyes phosphorus strong acids and alkalies.

(2) Processes which mechanically injure the continuity of the skin, such as brushing, scratching and rubbing *e g.,* friction from dust, sand, pumice, silicates

(3) Substances which soften and macerate the integument, such as water alkalies soap soda, lime, ammonia.

(4) Substances which dissolve and remove the natural grease of the *skin e g turpentine petroleum petrol* and benzine and its homologues and their nitro- and amido-derivatives

(5) Oils particularly the heavy oils used for lubrication, mineral oil, linseed oil etc. Thinners white spirit, dyes, paints, cellulose paints, polishes etc.

(6) Certain plants by irritants in their hairs, glucosides and other bodies in their juices and certain woods chiefly in the form of irritating sawdust as teak

(7) Infections encountered in the course of work from vegetable parasites animal ringworms anthrax tubercle bacteria and animal *parasites in grain itch, copra itch, etc.*

(8) Exposure to X rays and radio-active substances

Clinical features —

Site. As a rule the parts affected are the hands particularly the dorsal surface the flexure of the wrists and the undersurfaces of the forearms and *from them the eruption often extends The face and neck* are sometimes affected secondarily and occasionally primarily from contact with dust and powders in the air and from containers carried on the shoulders. When the patient works with gases or fine powders or with irritant fluids, *the* covered parts may be attacked and the eruption is then most marked in the *flexures, particularly the groins and axillæ* and the genital region.

Types of eruption —

Traumatic dermatitis arises from contact with gross irritants and takes the form of an erythema with blistering or ulceration in severe cases.

Eczematous. Erythemato-vesicular type The commonest type of dermatitis *is erythema which frequently passes* on to vesication. The

severe ulceration. Weak solutions of the corrosive acids produce an eczematous eruption. They are used in various manufacturing processes (Fig. 140) and also for household cleaning, e.g., hydrochloric acid "spirits of salt."

Alkalies. Strong solutions of caustic potash and caustic soda stain the skin a reddish or brown colour and the burns which result from them are often severe. The nails become dull and cracked and jagged and separate from the nail-bed. Milder degrees of dermatitis are caused by soda used in household cleansing paint cleaning etc. "Sugar soap," a crude form of soda, is frequently used by painters (see also Lime).

Antiseptics. Surgeons and nurses are frequently sufferers from eczematous dermatitis caused by carbolic acid, lysol and other antiseptics. The frequent washing and scrubbing of the hands tend to increase the



FIG 150. Dermatitis from antiseptics. Lavatory attendant.

irritant effect of the chemicals. In some cases the eruption resembles pompholyx, the vesicles forming along the sides of the fingers. The irritant action of the antiseptics may be alleviated by the use of astringent hand lotions such as equal parts of red lotion and glycerine applied after washing at the end of an operation. Patch test investigation is important here for it may be found that a single particular antiseptic or soap or polish used in ward is responsible for a contact dermatitis and avoidance of this may enable the individual to keep clear of skin trouble.

Arsenic causes an eczematous eruption and ulceration. Tanners and the makers of arsenical pigments and sheep-dip are the most frequent sufferers. In some forms of arsenical pigment and weed-killer the substance is a fine powder which attacks not only the exposed parts but also those which are covered. In many cases in addition to the cutaneous affection there is perforation of the cartilaginous septum of the nose. Keratoses on exposed parts leading to cancer is met with in the workers in arsenic mines and in the makers of sheep-dip.

Cancer must be included as a result of irritants used in trades. The commonest is tar cancer caused by crude tar and its derivatives, paraffin, soot, arsenic and mineral oils. The tumours occur usually on the hands and face and the scrotum.

Workmen's Compensation. Among the industrial diseases which are contained in the Schedule of 1906 and its more recent extensions, are



Fig 140 Hydrochloric acid dermatitis in a galvaniser

anthrax dermatitis produced by dust or liquids, ulceration and cancer produced by tar and its derivatives mineral oils and paraffin, sweeps cancer mule spinners cancer chrome ulceration and the effects of X rays and radioactive substances. The Workmen's Compensation Acts ensure that provision should be made for permanent or temporary disablement due to any of the conditions mentioned.

The following in alphabetical order are some of the common causes of occupational skin diseases.

Acids, especially when undiluted, cause circumscribed burns of the skin. Nitric acid stains the skin yellow sulphuric acid a dirty brown or red colour and carbolic acid a greyish white. Hydrofluoric acid causes

Reference—S. A. Henry Cancer of the Scrotum in Relation to Occupation 1946, *Oxford Univ. Press*

Sulphide of arsenic produces a chronic ulcer called pigeonneau by French authors

'**Asbestos corns**' from splinters of crude asbestos penetrating the skin afflict asbestos workers

Asphalte causes eruptions similar to those produced by tar (*vide infra*).

Bakelite and the 'plastics' elaborated on a formalin-urea basis provoke dermatitis in susceptible persons

Bakers Dermatitis amongst bakers (Fig 151) may be due to Chinese or other flours or the bleaching process involving the use of chemicals (*e.g*



Fig 151 Bakers dermatitis, secondary sepsis.

persulphate) Yeast has also been blamed There is no reliable evidence that animal parasites are the cause Acquired allergy would explain some cases and in others sugar and other ingredients have undoubtedly com



Fig 152. Water maceration (crockery washing at restaurant).

plicated the issue The dermatitis is localised as a rule to the hands and inner sides of the forearms and in rare instances has been widely spread. Itching is followed by vesication or pustulation The condition responds usually to soothing treatment if the parts are protected from contact with dough. Relapses often occur on the return of the worker to his employment Patch test investigation may be helpful but many cases appear to depend mainly upon the traumatic effect of the dough sticking to the skin and rough methods of removing it.

Barbers suffer from eczematous dermatitis from the constant wetting of the hands and also from the use of shampoo lotions containing spirit

ammonia and other chemicals and from dyes. Cases of ringworm contracted in this occupation have also been seen.

Minute fragments of hair penetrate the skin of the fingers and finger clefts and about the nails of barbers and may provoke a traumatic dermatitis or give rise to septic infection and small granulomata.

Barmaids and servants employed in restaurants, whose hands are constantly wet from beer and washing glass, china, etc., are often sufferers from dermatitis and paronychia. The trouble is more common in winter and depends largely upon insufficient drying of the hands (Fig 152). Monilial intertrigo and peronychial infections are also seen.

Bichromates are the cause of many cases of dermatitis, the eruption



FIG. 152. Bichromate dermatitis in a French polisher.

varying from vesication to actual ulceration, "chrome ulcers." The bichromates are largely used in dyeing, furniture polishing, stick-dressing, etc. The nails are stained brown (Fig 153). Legge points out that chrome irritation, even of many years duration, does not cause cancer.

Bleachers and cleaners using *chloride of lime* and "vitriol" suffer from a dermatitis of the hands, more marked upon the palmar surfaces. Relapses are common.

Boots and shoes may provoke a chrome or dye or rubber dermatitis.

Butchers and others who handle the dead carcases of animals are sometimes infected with tubercle (*vide* p. 475). An acute form of malignant pemphigus (p. 611), and erysipeloid (p 450) may also occur

Carbide of calcium acts as an irritant and may cause dermatitis.

Chemists are also liable to contact dermatitis In some cases there is remarkable susceptibility to certain substances. The extraction of *alkaloids is a frequent cause of dermatitis* Morphine codeine heroin and strychnine are the common irritants Cranston Low has shown by experiment that the acids used in the manufacture are not the cause. Occasionally crude opium acts exactly like morphine.

Chimney-sweeps *suffer in the first instance from an eczematous* dermatitis which is followed by thickening of the skin and the production of warty tumours which may become malignant The scrotum is the part most commonly affected.

Chlorine workers suffer from a follicular eruption which resembles acne



Fig 154 Chrome holes (ulcers).

Coal dust at sites of friction and pressure and water in coal mines may irritate the skin

Cocaine and novocain may cause dermatitis (*vide* Dentists *infra*)

Coopers are affected by the caustic soda used to clean barrels The eruption is of the common irritant type.

Copra itch, which is caused by an animal parasite is discussed on p. 378.

Coral cut is the name given to septic sores occurring *on the legs* of seamen wading ashore on coral islands Cleland believes that there is an infection derived from the coral

Dentists may suffer from cocaine and novocain dermatitis. The index and *adjacent finger* ends and nails are affected.

Dyes and substances used in their manufacture are common causes of dermatitis (Fig 155) The *aniline* dyes usually betray the cause of the eruption by the staining of the nails We have seen several cases in which

the irritant was *Bismarck Brown*. *Aurantia*, hexanitro-diphenyl-amine, a dye used in the staining of the cheaper kinds of brown boots and shoes, causes a vesicular eruption (*vide* p. 323).

Di-nitro-chlor-benzole produces an acute œdematous erythemato-papular itching dermatitis with sometimes a distinct yellow tinge on any parts touched by the crystals. It is used in the manufacture of certain dyes.

Explosives. The manufacture of high explosives on the enormous scale demanded by modern warfare introduced a number of cutaneous affections, which in some instances are associated with grave constitutional symptoms. Benzine and its homologues have a toxic action on the human subject and the nitro bodies used as high explosives are the more toxic in



Fig 133 Dermatitis in a fur-dyer

proportion to the number of nitro groups they contain. Toluene comes first, then Mono-nitro-toluene, and lastly Tri nitro-toluene. The poisons used as explosives or in their manufacture that are a real danger are —

(1) Tri nitro-toluene.
(2) Tetryl.
(3) Picric Acid.
(4) Fulminate of Mercury
(5) Barium Salts.
(6) Di-nitro-phenol.
(7) Hexa-nitro-diphenylamine.
(8) Mixed Acids.

(1) *Tri-nitro-toluene* (T.N T). Amatol and Ammonal, combinations which owe their toxic effects to T.N T The skin and hair are stained yellow The eruptions produced are erythema, œdema and vesication, and

rarely small ulcers, powder holes In some cases the vesicles on the hands and fingers resemble cheiro-pompholyx The sensory symptoms are itching and burning Secondary infection may lead to septic conditions of the affected skin sometimes with thrombosis and phlebitis. Exfoliation of the affected areas is common. Moist, greasy conditions of the skin favour the development of the dermatitis hence more cases occur in the warmer seasons of the year The eruption may persist for several weeks after the patient has been withdrawn from the work and septic cases may last months. Purpura is a rare phenomenon but of great clinical import as it signifies that there are grave blood changes—aplastic anæmia, which may be rapidly fatal Gastro-intestinal symptoms and jaundice and acute yellow atrophy of the liver may occur and certain individuals show a special susceptibility in this respect. Reactions to these chemicals are both idiosyncratic and toxic.

(2) *Tetryl* (Tetra nitro-methylaniline, or more correctly Tri-nitro-phenyl methyl nitramine) The skin and hair are stained yellow The eruption is usually a diffuse erythema, often associated with gross œdema. Papulation and pustulation also occur The eruption is commonly worse on the face and neck the conjunctivæ being often involved The hands and arms are not frequently affected. A transient asthmatic seizure and epistaxis may occur Nausea and vomiting accompanied by epigastric pain are reported. Idiosyncrasy is common and the incidence of dermatitis high. Sequeira has seen an acute attack in a susceptible subject from travelling in a railway carriage with a worker

(3) *Picric acid* (melinite or lyddite) is tri nitro-phenol. The skin and hair are stained yellow Occasionally a simple erythema develops on the hands and forearms

(4) *Fulminate of mercury* used to fill detonators, does not cause mercurialisation Dermatitis of the hands forearms and face, especially about the eyes may occur The incidence of dermatitis among workers was very high before adequate precautions were taken

(5) *Barium salts* are used in the manufacture of flares (Véry lights). The hair of operators may be bleached and loss of the hair and the eye-brows has been noticed.

(6) *Di nitro-phenol* has been used in France. It is believed to be more poisonous than T.N T So far no dermatitis has been reported, but covered areas of the skin may excrete the substance and show a patchy yellow discoloration

(7) *Hexa nitro-diphenylamine* (aurantia) was combined with T.N T in bombs dropped in London and elsewhere during the 1914 18 war Sequeira saw sixty cases in persons who touched the powder from broken, unexploded bombs The skin was stained an orange tint. The eruption was an acute vesicular dermatitis with closely set lesions involving the palmar surface of the hands and fingers and occasionally the feet. The eruption developed, as a rule nine days after contact, and in some instances led to extensive exfoliation and protracted inflammation due to secondary sepsis

(8) *Mixed acids* In the process of nitrating operators are very liable to lesions from splashing of the mixed acids used We have seen cases in which cheloidal scars were produced.

"*Mustard gas dermatitis* A di-chlor-ethyl-sulphide gas, having a mustard odour acts as an intense irritant, producing an acute dermatitis which begins from four to six hours after exposure. Several weeks may elapse before the eruption clears up. In gas warfare the vapour affects the flexures, moist and greasy parts; the liquid gas affects the sites on which it alights. The burns have a characteristic appearance with rainbow colours round the margin. Tear gas may cause dermatitis.

Flax, jute and wool may produce irritant dermatitis, which is also seen in the silk workers in France and elsewhere.

Formalin. The skin is remarkably sensitive to this agent. Numerous cases of formalin dermatitis occur in pathologists and others handling



FIG. 134. Lime dermatitis.

specimens preserved in formalin. Formalin is used for plastics and glue. The dermatitis is erythematous and vesicular and prone to recur.

Paper that is sent abroad is passed through a solution of formalin, and this type of dermatitis is consequently seen in paper workers.

French polishers and others who use bichromate of potassium and similar salts, varnish, shellac, turpentine, alkalies and dyes frequently suffer from dermatitis, and here the staining of the nails is a guide to the nature of the affection (see Bichromates, p. 329).

Glass. Fine spicules of spun glass penetrate the skin of spun glass workers and cause dermatitis.

Glues. Synthetic plastic glues provoke dermatitis probably from formaldehyde and from mechanical trauma due to dried particles.

Grain itch is considered at p. 377

Grooms and coachmen and others having charge of horses and cattle are sometimes infected by *ringworm* (p. 303)

Hides and skins Workers who handle the skins and hides of animals are liable to **anthrax** (p 467)

Lime The wide use of lime cement etc. in engineering and by masons, plasterers and others engaged in the building trade causes chronic dermatitis of the hands, often with considerable *thickening of the epidermis* and painful fissures and ulcers lime holes pigeonneau (Fig 156).

Luminisers using radio active paints etc. may develop dermatitis about the ends of the fingers.

Mineral oils used in manufacture and classed as "cutting oils, cutting



FIG 157 Oil acne.

compounds etc are employed for cooling lubricating and cleansing They affect the skin and hair follicles causing blackheads and red, *discrete* papules and pustules mainly confined to the hands and forearms (Fig 157). *(See Mule-spinners cancer) They also give rise to eczematous dermatitis.*

Mule-spinners cancer In 1923–24 *252* cases of mule-spinners *cancer* were investigated by the medical officers of the Home Office. The irritant is a mineral oil which is constantly forced through the clothing by contact with the "mule' used in cotton spinning The long-continued irritation caused cancer *in the scrotal region in 82·2 per* cent. of the workers. Since similar oils are used in other trades without this high incidence of cancer Robertson has suggested that the trauma occasioned by the mule plays an important *rôle*

Naphtha workers suffer from a dermatitis similar to that produced by tar (*vide infra*).

Novocain. Novocain dermatitis occurs in dentists. The eruption consists of itching vesicles on the tips of the fingers produced by massaging the drug into the gums of patients. An acquired sensitisation may develop and the slightest contact with the drug will cause a relapse.

Oils and greases may provoke dermatitis or oil acne and folliculitis and boils. Alkaline oil and water mixtures ("Suds") widely used in engineering are a source of much trouble.

Painters and workers in encaustic are also liable to dermatitis from irritants used in their employment, particularly turpentine and similar substances or strong alkali solutions used to clean paintwork.

Paraffin is an irritant like tar (*vide infra*).

Pathologists and post-mortem attendants are liable to infection of the hand by the *tubercle* bacillus (p. 473), and warty lesions may result.

Petrol dermatitis may result from aviation crashes. The lesions exactly resemble a burn of the first and second degrees. The area is often large. An immediate change of clothing is necessary and a lead lotion, with or without calamine 10 per cent., is applied. Greasy applications increase the discomfort of the patient. Cure is usually rapid and complete.

Phosphorus may cause an intractable dermatitis in rare cases. The sesquisulphide is much more irritant than the ordinary amorphous phosphorus used in making matches (see "Match-box dermatitis," p. 332).

Photographers are liable to an eczematous eruption produced by metol, and those engaged in autotype production suffer from bichromate dermatitis.

Plastics (see bakelite) are a source of sensitisation dermatitis in susceptible individuals.

Printers and electrotypers handling lye to wash off the carbon from the formes are subject to an eczematous dermatitis. Lithographic printers may suffer from dermatitis due to inks, paraffin, turpentine, oils or acids employed.

Rubber workers who use carbon disulphide are liable to an irritant dermatitis, from this and other causes. Leukodermia has also been reported.

Salt-water boils. These are an affliction of deep-sea fishermen. It only affects those men who actually handle fish on deck. Two types of lesions occur: one affects the radial aspects of the wrists, and the other the upper part of the forearms. The former is due to the chafing of the seawater-soaked sleeve. The skin becomes thickened, with raised red areas on which small pustules form, affecting the follicles. The lesions on the upper part of the forearm are a severe folliculitis with an acute inflammatory reaction round the affected area. The coalescence of inflamed areas may cause swelling and inflammation of the whole forearm. Scars are left by the boils which are caused by secondary staphylococcal infection.

Shellac workers are also affected, probably by *turpentine* and *arsenic*.

Silicate, used for packing round cold storage apparatus and about boilers, causes dermatitis, probably from the mechanical irritation of the material. Frequent inspection of the workmen is necessary.

Silver. Adamson showed a case of local argyria in a man who worked

with silver nitrate Pigmentation was confined to the parts about the mouth and especially the naso-labial furrow Similar conditions occur sometimes in workers with powdered silver and from the application of silver preparations to the eye It would appear that the silver is deposited directly in the skin.

Silver and electro-plating cause a papular and papulo-vesicular eruption on the backs of the hands *Mercury* and also *cyanide of potassium* are used in the processes Nickel, cadmium, chromium copper caustics, acids etc used in allied plating processes cause similar troubles

Soap, soda and cleansing powders. Washerwomen scrubbers and domestic servants suffer frequently from the constant use of strong soaps



Fig. 158. Sugar dermatitis.

and soda. The repeated maceration of the epidermis in water renders the skin more susceptible (Fig 152) In out patient practice it is common to see eczematous conditions of the face in young children who are washed with soap intended for house-cleaning and quite unsuited to the tender skin of an infant.

Spectacle dermatitis arises from "plastic" and from "nickel" and "chrome" spectacle frames

Suspender dermatitis results from similar causes and sometimes from rubber

Sugar Grocers confectioners and others who handle sugar suffer from an acute form of dermatitis which often becomes pustular The eruption is usually irritable and was at one time known as "sugar bakers itch" (Fig 158) It was commonly seen at the London Hospital when there

were several sugar "bakeries" in the neighbourhood. We see a number of cases every year in girls who are engaged in packing sweets.

Tar workers suffer from a series of cutaneous affections. The majority of cases are seen in those who handle tar pitch, creosote, anthracene, which are all derived from the distillation of coal. We have seen cases in men who spray roads with tar Creosoters of railway sleepers, telegraph posts, and wooden buildings may be affected. In the earliest stage there is an eczematous dermatitis. Later there are thickening of the skin and the production of warty growths, which develop into papillomatous



Fig. 159. Tar acne The back and chest were also affected.

tumours (tar molluscs) (Fig 160), many of which fall off. In other subjects there is a tendency for these tumours to develop into epitheliomata. The presence of a carcinogenic factor in coal tar has been demonstrated experimentally Blast furnace tar is harmless. A severe form of acne also occurs in tar workers (Fig 159) and degrees of melanosis are common (see Riehl's melanosis, p. 274).

Vanilla used in confectionery causes erythema, papules and vesicles.

Wet-winders working in cotton-mills may suffer from acro-asphyxia, venous stasis with marked terminal anaesthesia of the ends of the fingers leading occasionally to superficial necrosis. This is due to constant contact with cold water containing potash alum.

PRACTICAL DERMATOLOGY 22

Woods. Certain woods notably teak (*Tectona grandis*), rosewood (*Dalbergia latifolia*) ebony (*Diospyrus ebenum*) East Indian satinwood (*Chloroxylon swietenia*) Oregon pine, produce an irritant dermatitis. Satinwood causes papulo-vesicular eruption with brawny swelling The face may be involved and the upper air passages are acutely inflamed. The irritant in this case is a crystalline alkaloid (Cash) In other woods an essential oil is believed to be the noxious agent Coccus wood used in making flutes also causes an eczematous eruption and musicians occasionally suffer from a dermatitis of the lips from contact with mouthpieces made from grenadilla wood or a synthetic Cane cutters in Provence and other parts are liable to an irritable erysipelatoid eruption with the

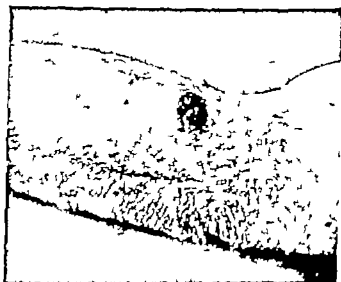


Fig 160. Tar molluscum.

development of blebs It is not certain whether this is due to an irritant in the reeds (*Arundo donax*) or to some vegetable or animal parasite.

The *precautions* necessary to prevent occupational dermatitis are —

(1) *Clean working* Among unskilled workers the eruptions and general toxic symptoms are commoner when new factories are opened.

(2) *Ample facilities for washing are imperative* No food should be taken before the hands and face are washed

(3) *The operators must wear protective overalls and caps.* Veils are sometimes employed. Clothes impregnated with powder may convey irritation to members of a family not working Exhaust ventilation will remove noxious dust and is now largely used

(4) Gloves are often employed with advantage but they tend to maceration of the skin and are easily contaminated inside. Skin varnishes, barrier creams and powders are sometimes used

(5) All specially susceptible individuals must be excluded

(6) Regular medical inspection should be enforced

In many industries protective applications so-called barrier creams, are used on the hands before starting work. Such preparations contain an emulsifying base and often a soap-clay mixture and leave an invisible film

on the skin which mechanically and partly by adsorption protects the skin from irritant dusts and liquids.

Treatment. The patient should be removed from work. Affected areas of the skin should be cleansed with a weak alkaline solution (ʒi sodii bicarb. to 2 pints of water) or with sterile olive oil. The application of a liniment of calamine (calamine 85 grains, olive oil and lime water of each half an ounce) is of great service. If alkalies are the cause boric lotion should be used to cleanse the parts and simple oil or liquid paraffin be applied. Calamine lotion or liniment containing lime water is apt to aggravate an alkali dermatitis. Sedatives may be necessary to relieve irritation and small doses of X-rays are often helpful. Where oils paraffin or grease cause dermatitis or folliculitis their removal after work with a sulphonated castor oil containing 2 per cent. wetting agent may prevent irritation. Septic infection is treated on the usual lines by boric acid fomentations and a mild mercurial ointment (hydrarg. ammon. grains 10 soft paraffin ℥i). Alternation of work should be advised.

REFERENCES—R. PROSSER WHITE. "Occupational Diseases of the Skin," 4th edn. with copious references to original papers. N. SCHWARTZ and L. TULIPAN "Occupational Diseases of the Skin."

Dermatitis caused by Plants

The commonest form of plant irritation met with in this country is the nettle sting, which causes transient wheals. More severe inflammations occur from contact with the *Primula obconica* and *P. sinensis* which are



FIG. 161. *Primula obconica* (by courtesy of Messrs. Sutton and Sons).

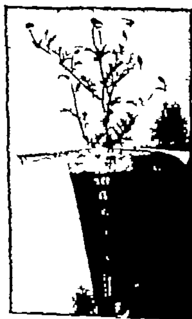


FIG. 162. May-weed (*Anthemis cotula*).

admired greenhouse plants The eruption is vesicular and erythematous and may be attended with general symptoms. The poison ivy (*Rhus toxicodendron*) dogwood (*Rhus venenata*) and the poison oak (*Rhus diversiloba*) may also cause an acute erythemato-vesicular eruption. *R toxicodendron* (also called *Ampelopsis Hoggii*) is sometimes used in this country as a creeper We have seen several instances where the rash has followed trimming the overgrowth. In the tropics, lacquer (a brown balsam obtained from *Rhus vernicifera*) by simple contact may cause fever œdema and tension of the skin of the face limbs and genitalia and nasal and conjunctival catarrh. Toyama claims to have isolated a non volatile body which is the irritant. A severe dermatitis followed the application of an ethereal solution of lacquer found in an antique chest which had been buried 1 000 years Lily dermatitis is the name given to an eruption occurring in the gatherers of daffodils in the Scilly Isles. "Lily dermatitis, tulip dermatitis and "tulip fingers" are common in

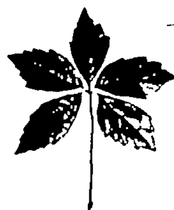


Fig 103. *Ampelopsis Veitchii.* Not Irritant.



Fig. 104 *Rhus toxicodendron* Poison ivy

Lincolnshire, Holland and other bulb-growing districts. Tulip fingers are characterised by painful splitting of the skin of the thumb and finger pulps and round the nail with secondary inflammatory swelling It is probably in part traumatic and infective though an element of idiosyncrasy no doubt exists. We have had the opportunity of examining a number of cases of dermatitis in women engaged in cutting daffodils and chrysanthemums for the London market. The eruption is of the erythemato-vesicular type. The most severe bullous eruption may follow contact with "May weed" (Fig 100), and this reaction is well known in some districts Dermatitis from contact with grass has been described under the name of dermatitis bullosa pratensis striata.

In tropical countries the juices of a number of the *Anacardiaceæ* particularly the group of *comocladiæ* and several of the *Euphorbiaceæ* cause intense vesicular dermatitis, sometimes attended with fever Pardo-Castello states that in the Antilles more than forty species of plants produce skin reactions varying from erythema and pruritus to severe bullous dermatitis.

Pyrethrum, grown in Kenya on a large scale as an insecticide, frequently causes a severe dermatitis incapacitating European planters. Idiosyncrasy is a marked factor but an acquired allergy may be highly developed.

Plants known to have caused dermatitis are :—

Anacardium occidentale and *orientale*
Angelica (cow parsley).
Asparagus officinalis.
Balm of Gilead (*Balsamum opobalsamum*).
Bell-heather
Bitter orange.
Burdock (*Arctum lappa*).
Buttercup (*Ranunculus*).
Chrysanthemum.
Colchicum.
Cotoneaster microphylla.
Cowhage (*Mucuna pruriens*).
Cow parsnip (*Heracleum giganteum*).
Cucumber
Daffodil (juice of stem).
Daphne mezereum.
Dogwood (*Rhus venenata*).
Eucalyptus hemiphloia.
Euphorbiaceæ, including spurges and many tropical species. *Platygyne pruriens, Tragia volubilis Jatropha urens*
Feverfew
Fig (*Ficus*) (the sap).
Foxglove.
Geranium.
Grass.
Hops (*Cannabinaceæ*).
Humea elegans.
Indian Bean (*Catalpa bignonoides*).
Indian Turnip (*Psoralia esculenta*).
Ivy (*Hedera helix*).
Lady's Slipper (*Cypripedium calceolus*)
Larkspur (Delphinium).
Laurel.
Leopard's Bane (*Doronicum pardalianches*).
Lilac (*Syringa vulgaris*).
May weed (*Anthemis cotula*).
Metoprum toxiforum (Poison wood or poison bark) *B.M.J.* 1946 **2**, 298.
Millfoil (*Achillea millifolium*)
Nettle (*Urtica urens*).
Oleander (*Nerium oleander*).
Parsnip (*Plastinaca sativa*).
Poison Ivy [1] (*Rhus toxicodendron Ampelopsis Hoggii*).
Primula obconica and *P. sinensis*
Pyrethrum.

[1] The *Ampelopsis Hoggii* (*Rhus toxicodendron*) has three-lobed leaves; the commoner *Ampelopsis Veitchii* is five-lobed (see Figs. 103, 104).

Quebracho (*Schinopsis lorentzii*)
Rhus vernicifera.
Rue (*Ruta graveolens*)
Skunk cabbage (*Simplocarpus fetidus*)
Smart weed or Water pepper (*Polygonum punctatum*).
Spurge (several species of *Euphorbia*)
Sumac
Squill (*Scilla*)
Thrapsid
Tomato leaves and pollen (*Lycopersicum esculentum*)
Vanilla (*Vanilla plantifolia*)

Individual idiosyncrasy is an important factor in plant dermatitis and in some cases the plants are more irritant at certain seasons

The irritant in some plants is in the juice or sap In others it is in the



FIG. 163 Dermatitis from *Primula obconica*

hairs on the leaves or fruit In Quebracho dermatitis in the Argentine leaves flowers fruit and alcohol and water extracts produce the rash. We have seen acute allergic dermatitis of trunk and limbs in a susceptible subject result from entering a tomato house—apparently from inhalation of pollen In many instances it appears to be a glucoside Cranston Low has shown that it is possible by rubbing the juice of a plant such as *Primula obconica* into the broken or unbroken skin to sensitise the skin to that plant This sensitisation is general over the skin but is limited to the integument

Schamberg and others have shown that a temporary immunity to Rhus poisoning may be obtained by the oral administration of extracts made from the plants

Symptoms of plant dermatitis. In a characteristic case the onset is rapid the hands, face and genitals are covered with closely set minute

vesicles and bullæ on an erythematous base The eruption itches intensely and there is often considerable tumefaction of the face (Fig 165), the eyelids may be so swollen that opening them is impossible and in bad cases the lips may be so œdematous that the saliva dribbles through the open mouth. Swelling of the ears is a common feature and oozing in the retro-auricular sulci may occur Œdema of the hands may impair movement and swelling of the scrotum accompanied by intense pruritus causes great discomfort. The eruption may last from a few days to three or four weeks in susceptible subjects.

There is evidence that exposure to sun light may make the condition worse. The plant irritant causes a photo-sensitiveness, hence a phyto-photo-dermatitis such as occurs in some cases of pyrethrum dermatitis which causes considerable disability in European planters in Kenya. Sequeira has seen allergic phenomena. They occur in other types of plant dermatitis.

The eruption is often mistaken for erysipelas, but its appearance in gardeners or pickers, amateur or professional, should lead to careful enquiry as to the possibility of plant poisoning

Treatment. A number of remedies have been used for plant dermatitis. As a rule treatment should be on the lines of that for acute vesicular eczema. The parts should be protected by soothing lotions and creams (p. 748), and hyposulphite of soda lotion, a drachm to the ounce, is recommended. Weak alkaline applications are preferred for the more severe reactions, a 1 per cent. solution of Liq potassæ with alcohol, glycerine and water having proved of service A useful cooling lotion is prepared by adding 1 drachm of liquor plumbi subacet fort. to 10 ounces of cold boiled milk.



FIG. 166. Bullous eruption from Mayweed. (A phyto photo dermatitis probably)

Dermatitis due to Local Application of Drugs

Certain remedies applied to the skin for therapeutic purposes cause eruptions. The commonest met with in practice are shortly described in the following paragraphs

Acriflavine has been known to cause dermatitis and we have seen examples of this.

Arnica a household remedy applied in the form of a tincture to bruises,

etc, may cause a papular erythema which may spread widely from the part treated. In many cases the eruption resembles an acute rapidly extending eczema.

Atropine and belladonna, when used in ophthalmic practice occasionally cause an acute erythematous eruption and oedema and a belladonna plaster may also excite a dermatitis.

Cade oil is often used for psoriasis and seborrhoeic eruptions. It may cause erythema but has a special affinity for the hair follicles, producing a



Fig 107 Dermatitis due to hair lotion.

suppurative *folliculitis* We have seen a *condition resembling exfoliative dermatitis* from its use

Cantharides often applied for alopecia and for the relief of pain, produces *an erythema if in dilute solution and vesication if strong* Cheloid may follow

Capsicum. An acute erythema may be produced by the application of this substance *It is frequently used on wool as a counter irritant*

Carbolic acid sometimes causes an eczematous dermatitis If strong it acts as an escharotic We have known one application cause cheloid.

Chrysarobin or dithranol used for psoriasis and for tinea produces an acute erythema of the skin which may spread far beyond the parts to which it is applied. The characteristics of the eruption are a peculiar tint, resembling *prune juice* and subsequent brownish staining The affected skin is

hot and often very irritable Where the drug has been used near the face the acute erythema with œdema produces an appearance strongly suggesting erysipelas. In rare cases there may be general malaise and pyrexia. Very rarely a generalised exfoliative dermatitis has been caused by chrysarobin and has lasted for several months.

Cocaine. Pea-sized spots of blue atrophy of the skin in the sites of cocaine-injections have been reported by Gotthell and by René Horand. According to these authors the lesions are peculiar to cocaine. Dermatitis also occurs

Croton oil is sometimes used as a counter-irritant and for the treatment of obstinate cases of scalp ringworm. Its application causes a pustular folliculitis.

D.D T may rarely cause dermatitis.

Dyes such as gentian violet and other aniline derivatives irritate some skins.

Formalin, even in weak solution, may provoke an irritant dermatitis (*vide* p 343) and eruptions of the cheiro-pompholyx type have been met with in laboratory workers.

Iodine, besides staining the skin, sets up an erythema which is followed by desquamation. This property of desquamation is used in the treat ment of ringworm of the glabrous skin. We have seen vesicular and bullous eruptions from the absorption of iodine painted on the skin and in one case a cheloid arose on the painted area.

Iodoform occasionally sets up an acute erythema of the scarlatiniform type Rarely a general exfoliative dermatitis may occur In some cases there have been grave general symptoms with bullous and hæmorrhagic ruptions.

Mercury applied to the skin in the inunction treatment of syphilis occasionally causes an erythematous eruption. It should never be used in hairy regions, as a pustular folliculitis may be set up.

Methyl-salicylate, which is commonly used in the local treatment of prains etc may cause a painful papulo-vesicular eruption.

Mustard causes an erythema. Prolonged application of mustard plasters is likely to cause a vesicular eruption.

Novocain produces an eruption of small vesicles on the tips of the fingers of dentists.

Paraphenylenediamine used for dyeing the hair may cause a severe dermatitis which may spread on to the face and to flexures.

Penicillin may rarely cause dermatitis.

Peroxide of hydrogen and the peroxides if strong may cause erythema and vesication. Part of this irritation may be due to acids in the solutions

Picric acid. A dermatitis of erythemato-vesicular type may follow the application of a 1 per cent. solution. This idiosyncrasy is rare but may be responsible for very severe and widespread erythemato-bullous eruptions.

Pyrogallic acid, used therapeutically and also in hair dyes may cause acute inflammation with œdema

Pyrethrum used in powder form or spray as an insecticide may produce a dermatitis of vesicular type which may spread over the body

etc. may cause a papular erythema, which may spread widely from the part treated. In many cases the eruption resembles an acute rapidly extending eczema.

Atropine and belladonna, when used in ophthalmic practice, occasionally cause an acute erythematous eruption and œdema, and a belladonna plaster may also excite a dermatitis

Cade oil is often used for psoriasis and seborrhœic eruptions. It may cause erythema but has a special affinity for the hair follicles producing a



Fig 107 Dermatitis due to hair lotion.

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CHAPTER XVIII

OCCUPATIONAL DERMATOSES AND THEIR MEDICO LEGAL SIGNIFICANCE

Introduction. The conditions of employment may play some part in the etiology of many dermatological ills, constitutional or otherwise and it is not always possible to draw a hard and fast line between such ills and those in which we believe an occupational factor to be the *essential* cause. In this chapter however we attempt to review the recognised occupational dermatoses and their medico-legal significance. Much confusion exists over the use of the term "dermatitis" and it is not in our power to resolve that confusion but it will help if we explain how it arises.

The term "dermatitis" may literally be interpreted as relating to any inflammation of the skin, as impetigo, boil, ringworm, psoriasis, eczema, tuberculosis, etc., etc. Quite logically the laity and the legal profession commonly employ this interpretation.

Some dermatologists, recognising the logic of this usage, would merely qualify the term to indicate the apparent cause of the dermatitis, *e.g.*, pyogenic, tuberculous, chemical, psychogenic, etc.

On the other hand, many dermatologists use the term "dermatitis" to indicate an inflammation of the skin provoked by some external irritant, usually not infective, and associated with diffuse redness, swelling and vesication or blistering. Such dermatitis may follow contact with some chemical or with a substance to which the patient is specifically sensitive, *i.e.* a "contact dermatitis" as previously described.

This difficulty in nomenclature is not eased by the wording of statutory regulations concerning industrial dermatitis where "dermatitis produced by dust or liquids" is the only guide to practice.

Recognising these difficulties we propose to use the term dermatitis in this section to describe a non-infective catarrhal inflammation of the skin with a tendency to vesication and weeping and sometimes to thickening of the epidermis a reaction similar in many particulars to that we have described under eczema.

We believe that such a reaction may arise in industry in one of the following ways —

(1) From injury from strong irritants—usually dust or liquids, *i.e.*, a *traumatic dermatitis*

(2) From contact with a substance to which the worker is specifically sensitive *i.e.*, a *contact dermatitis*

(3) From long-continued exposure—usually to dust or liquids—the wear and tear resulting in *eventual* breakdown of the normal resistance of the skin and consequent *eczematous dermatitis*

(4) From an admittedly eczema-prone subject engaging in an unsuitable occupation and so experiencing a provocation or aggravation of his *constitutional eczema* as the result of contact with dust or liquids at his work

It must be accepted that while these groups may have distinctive

Salicylic acid even in 1 per cent or 2 per cent. strength may rarely cause irritation.

Scarlet-red. Eruptions produced by the local application of this drug have been reported. It is used as a blister in veterinary medicine.

Sulphonamides applied locally may cause a dermatitis which may be reawakened by giving the drug internally They also induce a photo-dermatitis

Sulphur used so frequently in scabies and other itching eruptions, is a common cause of dermatitis The eruption is of the eczematous type and



Fig. 168. Turpentine dermatitis, from the application of a liniment.

is attended with itching which may be attributed to the scabies. Non-recognition of this fact sometimes leads to persistence in the use of the sulphur and the production of a severe dermatitis usually in the form of a patchy macular erythema dry and slightly scaly with the red follicles prominent.

Tar acts as an irritant in many subjects It has a special affinity for the glandular elements of the skin and produces an acne-like eruption (*vide* Fig 159)

Turpentine and **terebene** are used as counter irritants In most persons they cause an erythema but if their use is prolonged a vesico-bullous eruption may develop (Fig 168)

removal from the cause but run the chronic and recurrent course of a constitutional eczema.

Industrial dermatoses fall into three categories :—

(1) Peculiar dermatoses associated with particular hazards.
(2) Accidents or injuries.
(3) Industrial dermatitis as described above *i.e.* :—
  (*a*) Traumatic dermatitis.
  (*b*) Contact dermatitis.
  (*c*) Dermatitis from long-continued exposure
  (*d*) Constitutional eczema provoked by dust or liquids.

These disorders are dealt with in the appropriate sections of this book, but a little elaboration may be helpful in this section.

I. Peculiar Industrial Dermatoses

The following are among the most common dermatoses of this group —

Industrial callosities. Many trades carry their own callosities, peculiar in character and distribution, but they are not a source of disability *e.g.*, miners, cobblers, harpists and fiddlers.

Industrial acne Oils, tar pitch, chlorine, especially in organic compounds as chlor naphthalene, carbontetra-chloride, etc., cause blackheads, indurated characteristic papules and pustules on those parts of the skin exposed to the irritant. The condition should not often become a source of disability

Boils occur in most of these trades and among fishermen and fisher girls from salt water irritation.

Beat knee **beat elbow**" and **beat hand** are conditions of infection of bursae or of subcutaneous tissues of these parts occurring in miners and being dependent in part upon repeated trauma or friction as a result of the nature of the employment.

Industrial ulcers. "Holes" are caused by the necrotic action of chrome nickel, cadmium, lime brine and other chemicals on small cuts and abrasions.

Industrial warts and carcinomata arise on the skin of workers in tar pitch, mineral oil ("mule spinners" in the cotton industry), arsenic and from exposure to weather ("sailor s skin") and to X-rays.

Anthrax occurs in agricultural workers and those who handle hides and hair and is a scheduled disease, but cattle ringworm, erysipeloid, vaccinia, warts tuberculosis, orf (a granulomatous nodule arising about the muzzle of sheep) and other animal infections are not scheduled diseases and do not entitle the sufferer to compensation unless arising as an accident.

Tattoo marking, staining or pigmentation of the skin occurs in coal, gas and tar workers, dye workers, chemical workers (picric, T.N T D.N C.B), polishers, etc., but is not a source of disability

II Accident or Injury

This will usually result from mechanical injury cuts, abrasions, lacerations, etc but may be due to other mechanical trauma or injury from heat or cold, from electricity or X ray or other radiations or from contact with

features it is nevertheless common for the dermatologist to be presented with eruptions in which he cannot, from clinical appearances alone indicate a particular or single cause There is considerable overlapping and a tendency even when early manifestations may be distinctive for later changes and end results to be common to all groups. An external provocative agent may itself induce a state of hypersensitivity of the skin, which then responds by eczematous eruptions independent of an external factor and indistinguishable from constitutional eczema.

In the majority of cases a worker suffering from dermatitis arising under paragraph 1 or 2 *i.e* traumatic or contact dermatitis, will recover if removed from the cause and he will receive compensation for that attack of dermatitis and will not anticipate a relapse so long as he avoids *the particular cause of the trouble.*

Dermatitis arising under paragraph 3, from long-continued exposure is commonly subject to relapse even when the worker is removed from the cause and he is entitled to a 'declaration of liability' from his employer which entitles him to claim compensation again should relapse occur

Finally an attack of constitutional eczema, paragraph 4 provoked by unsuitable employment, entitles the worker to compensation for that attack, but not, of course, for subsequent attacks unless they similarly result from unsuitable employment.

Though the matter will be dealt with later it might be mentioned here —while endeavouring to clarify some of the more common difficulties experienced in this field—that dermatitis arising in one or other of the manners indicated above entitles the workman to compensation under the Workmen's Compensation Act since this is a *scheduled disease* He has to obtain a certificate from the Certifying Factory Surgeon (Examining Surgeon) before he can claim compensation.

On the other hand should he suffer an accident, *e g* a cut or burn, and *should that accident give rise to secondary dermatitis* (from infection or treatment as may often happen after accidents) then while the workman is still entitled to compensation for the accident and any of its sequelæ (including dermatitis) he should not be certified by the Certifying Factory Surgeon as suffering from "dermatitis produced by dust or liquids" The *dermatitis is clearly related to the accident* and not to the workman's employment in terms of "dust and liquids"

Industrial dermatoses. As a general rule industrial dermatoses arise on the parts in contact with the irritant and clear when the worker is removed from that contact The backs of the fingers and hands the flexors of *wrists forearms bends of the elbows the face and sides of the neck* are the usual sites The palms and palmar aspects of the fingers are unusually resistant, the bases of finger clefts and flexures of the wrists and elbows particularly susceptible Where certain garments get saturated with the irritant, *e g.*, shoes or socks or trousers, then the parts of the body in contact *may be first and maximally affected* When the irritant is a fine dust or vapour it may chiefly affect the flexures under belts, etc., where it adheres to the moist and greasy parts

Some personal predisposition must be present in the worker who develops an industrial dermatitis under conditions which do not affect the majority of workers and this is why a number of cases do not clear on

carry its own protection in the form of exhaust fans for dusts and gases, splash guards for liquids and the machine itself as well as the floor and surroundings should be clean.

Workers should be protected by appropriate clothing—caps, aprons, gloves, etc. or by protective applications which keep dusts or liquids from the skin—"barrier creams," or facilitate their removal—"emulsifying cleansers," or both.

Barrier creams applied to the exposed parts of the skin before starting work leave an invisible film on the skin—a barrier or "invisible glove"—on which the industrial dust or liquid rests to be washed away with the barrier at the end of work. Theoretically this is an ideal protection and in practice it is of great value, but it is not possible to find the barrier against all substances or suitable for all occasions or works. Reference should be made to the memorandum on "Industrial Dermatitis and Barrier Creams," published by the Ministry of Labour and National Service, H.M. Stationery Office. Valuable proprietary barrier creams—they are not easily compounded by the ordinary dispensing chemist—are Rosalex, Halden's Protective Creams and Imoxa Barrier Creams.

"Emulsifying cleansers"—similar to soapless shampoos—aim at complete removal of the irritant from the skin and its appendages with the minimum of damage such as would result from the use of common soaps and alkaline cleansers and degreasers. They are particularly suitable for removing oils and greases paraffin and other degreasing agents. Sulphonated castor oil with 2 per cent. of some wetting agent, is an example of this type of cleanser and leaves a soft, supple skin.

Selection and direction of personnel may do much to avoid industrial dermatitis. Patients with very dry or moist or greasy skins are not suitable for trades that accentuate those disabilities. Sensitive and nervous and debilitated patients will have similar skins and will readily fall victim to industrial hazards. Seborrhoic and hyperidrotic patients for constitutional as well as dermatological reasons, are poor industrial risks.

Treatment. Treatment must not end with removal of the patient from his work and the mere application of bland remedies. If the subject can turn to other work and so avoid unemployment it is usually desirable. Any general disturbance which may seem to have predisposed should receive appropriate symptomatic treatment. Any special measures as X-ray therapy should be employed with a view to shortening an attack, for the shorter the period of damage to the skin and to the mind caused by an industrial hazard, the better the prognosis. Care must be taken not to aggravate the dermatitis by too vigorous local treatment.

Prognosis. This is good in the great majority of cases, provided the cause is recognised and the patient is not allowed to return to contact with it. Early recognition and the avoidance of more than one attack are important.

The causes of *industrial cancer* take effect slowly but continue to act for years after removal from the hazard. Patients working in such trades should be kept under observation throughout life.

The psychological aspect specially related to the sense of security or insecurity plays an important part in determining the course and prognosis in all industrial dermatoses. It is therefore helpful for patients to

chemicals producing dermatitis or burns, *e.g.* strong acids, alkalies, fulminate of mercury dinitrochlorbenzine, etc. *All or the majority of workers if exposed to these hazards will suffer injury*

III Industrial Dermatitis

To come within the meaning of the Workmen's Compensation Act an industrial dermatitis or eczema must be caused by dust or liquids. This will generally arise from —

(1) Wear and tear as the result of long-continued exposure.

(2) The development of a specific sensitisation after longer or shorter exposure to some substance with which the worker comes into contact.

(3) The patient being an eczema prone subject and unsuitable for the particular occupation.

Few or a minority of the workers in an industry will suffer damage from hazards considered in this section

(1) Dusts or liquids may act by destroying the natural fatty and keratinous protection of the epidermis—as in washerwomen, cleaners, millers and scourers in textile industries, wet grinders, workers in oil, bricklayers workers with paraffin and degreasing agents etc. Water and oil maceration and alkalies are the common causes

The removal of industrial substances from the skin, *e.g.*, dough in bakers, dirt and grease in engineers, etc. may damage the skin by trauma and determine the onset of a "wear and tear" dermatitis.

Dust or liquids themselves may act as mechanical irritants as in quarrymen, grinders, etc.

(2) A specific sensitisation may develop from longer or shorter contact with almost any substance Such dermatitis like most "allergic" reactions is often acute and associated with considerable œdema simulating an acute traumatic dermatitis

The specific sensitiveness may be demonstrated by the "*patch-test*" which is described in the section dealing with eczema and dermatitis. A little of the suspected substance is applied to the skin for a period of twenty four hours and if the worker is "sensitive" to it a positive reaction results

Detection of the particular cause in this way may enable a worker to keep at work by avoiding that substance. Such specific sensitisation once acquired is not likely to be lost. Weak solutions of chrome oils, dyes, turpentine, white spirit, varnishes antiseptics, polishes, nickel and other metals and cosmetics, are some of the substances to which sensitisation may arise causing dermatitis

(3) Dusts and liquids may act as mechanical or chemical irritants provoking eczema in those predisposed to such troubles The predisposition may be inborn or it may arise as part of such changes as accompany puberty pregnancy menopause, or may be the result of ill health, physical or mental

Prophylaxis. The prevention of industrial dermatitis is in large part determined by common sense

The first essential is a clean industry An efficient machine should

resulted in unsuccessful claims to compensation for personal injury by accident.

On the other hand, the workman should succeed in his claim for compensation if he can show that the disease resulted from accidental circumstances the occurrence of which he can fix approximately in point of time. Thus claims have been established in circumstances such as the following where a man had to wash up crockery in hot water and soda and his hands being in a super-sensitive condition became inflamed and the nails dropped off where cattle ringworm was contracted from infected calves and the workman was able to fix a date with reasonable certainty where a girl, after sustaining numerous cuts and scratches on her hands over a long period, ultimately became totally incapacitated from blood poisoning and it was held that she was none the less entitled to compensation because her disease was due not to one specific and definite accident but to a series of accidents each one of which was specific and ascertainable though its actual influence on the resulting illness could not be precisely fixed.

The Act does not apply to idiopathic diseases as the origin cannot be traced to a particular infection.

Idiosyncrasy pre-disposition, pre-existing weakness or other inherent defect in the workman himself are *not* factors which can militate against his claim to compensation for personal injury by accident.

Whilst other phrases in the section under review such as "arising out of and in the course of the employment" have given rise to much legal difficulty in definition, it is not considered that they call for special comment here in relation to cases of dermatitis.

B As an Industrial Disease under the Workmen's Compensation Act, 1925 Section 43

The Act provides that certain scheduled diseases due to the nature of the employment are within the Act and are for the purposes of compensation to be deemed personal injury "by accident."

It will thus be seen that apart altogether from the happening of anything in the nature of an accident as considered above the contracting of a scheduled disease under the conditions laid down in the Section gives rise to a claim for compensation.

The diseases are those specified in the Third Schedule of the Act and in orders issued by the Secretary of State

The following is an extract from the Schedules and Orders defining the dermatoses of occupational or industrial origin :—

Description of Disease or Injury.	*Description of Process.*
(1) Anthrax.	Handling of wool, hair bristles, hides and skins.
(2) Poisoning by Gonioma kamassi (African boxwood) or its sequelæ	Any process in the manufacture of articles from Gonioma Kamassi (African boxwood).
(3) Dermatitis produced by dust or liquids.	
(4) Ulceration of the skin produced by dust or liquids.	
(5) Ulceration of the mucous membrane of the nose or mouth produced by dust.	
(6) Epitheliomatous cancer or ulceration of the skin due to tar pitch, bitumen, mineral oil or paraffin, or any compound, product or residue of any of these substances.	Handling or use of tar, pitch, bitumen, mineral oil or paraffin or any compound, product or residue of any of these substances.

be early and accurately advised on the nature of their industrial ills—on the course such ills should take—their significance in relation to future employment and their medico-legal aspects These are usually matters for the expert.

Medico-Legal Aspects of Industrial Dermatitis

The claim of a workman or his dependants against the employer in relation to a dermatitis contracted by the workman falls to be considered under two headings.

A. As a personal injury by accident, *i.e.*, under the Workmen's Compensation Act, 1925 Section 1

B As an Industrial Disease *i.e* under the Workmen's Compensation Act, 1925 Section 43 as being one of the diseases mentioned in the Third Schedule to the Act

Claims may also arise at common law when the injury was caused by the personal negligence or wilful act of the employer or of some person for whose act or default the employer is responsible. In such a case the workman or his dependants may elect whether to claim compensation under the Workmen's Compensation Act or to take proceedings independently Such common law claims however do not possess any special medico-legal significance and it is not proposed to deal with them in these notes.

A Under Workmen's Compensation Act, 1925—As a Personal Injury by Accident

If in any employment personal injury by accident arising out of and in the course of the employment is caused to a workman, his employer shall, subject as mentioned in the Act, be liable to pay compensation.

Meaning of Accident

The word accident is used in the Act in its popular and ordinary sense, as an unlooked for mishap or an untoward event not expected or designed. It should be regarded from the point of view of the workman who suffers from it and whatever its cause it will be accidental so long as it was not designed by the workman himself

Examples of Dermatoses as Accidents

From accidents, as so defined, arise a wide range of skin affections. Amongst these may be noted cuts, abrasions and lacerations, the effects of excesses of heat or cold, shocks and burns from electricity burns and other trauma from X ray and other radiations and burns and dermatoses from contact with chemicals such as fulminate of mercury and dinitrochlorbenzene.

A disease which is gradually produced as a natural result of prolonged employment of a particular kind cannot be regarded as an accident and is not within the Act unless it falls within the provisions of Section 43 as an Industrial Disease. Thus, eczema caused gradually by exposure to fumes or splashes of chemicals and a dermatitis from the continued use by a hairdresser of certain shampooing ingredients have both

The word "sequelæ" used in the Schedule signifies "symptoms or morbid conditions which either remain or supervene after a disease has run its usual course" (Quain's Dictionary of Medicine")

With reference to "a localised new growth of the skin papillomatous or keratotic due to mineral oil" there is a special provision in the relevant order making it a condition precedent to compensation that at least one week before the date of the commencement of the disablement written notice shall have been given by the workman to the employer that application is to be made to the Examining Surgeon for a certificate of disablement, and notice, personally or in writing, is given to the Examining Surgeon that the workman is applying for such a certificate. Furthermore, compensation is not payable for more than fourteen days in all, unless the judge is satisfied that the workman is still disabled at the expiry of the fourteen days.

With reference to the dermatoses 3 4 and 5 p. 353 no compensation is payable if the workman is disabled only for employment in the particular process in which the disease has been contracted, or other process involving risk of the disease, unless the judge, committee or arbitrator is satisfied that the disease has been contracted through long continued exposure to dust or liquids in the industry in which the workman was engaged at the time of disablement. The question of whether the disease has been contracted through long-continued exposure is *one of fact*.

Susceptibility to Recurrence

The tendency of dermatitis to recur has been discussed in the earlier part of this chapter

The Act provides that the disablement or suspension is to be treated as the happening of the accident. It is the disease itself and not the disablement that is to be treated as the notional injury by accident so that the workman does not cease to be entitled to regard himself as having sustained injury by accident merely because his disablement ceases temporarily He continues to be entitled to treat himself as suffering from an injury arising out of an accident so long as he suffers from the disease and will be entitled to compensation if the disease breaks out again, unless there has been a finding or a certificate of complete recovery

Difficult questions, however may arise as to the cause of the recurrence and the implications of that cause If the recurrence is a recrudescence or continuance of the first attack the effects of which have not completely passed away then the workman's claim succeeds. If however the recurrence is due to the workman's own constitutional predisposition to the disease and his greater susceptibility to it, then the claim, founded as it is on the certificate of the Examining Surgeon, fails.

Observations on the Examining Surgeon's Certificate

The obtaining of a certificate is a condition precedent to a right to compensation for disablement. It is the certificate which creates or calls into being the notional accident upon which the claim is based.

The certificate must be a valid one and no order can be made upon one which is invalid.

It must be granted by the Examining Surgeon for the district in which

Description of Disease or Injury	Description of Process
(7) Ulceration of the corneal surface of the eye due to tar pitch bitumen mineral oil or paraffin or any compound product or residue of any of these substances.	Handling or use of tar pitch, bitumen, mineral oil or paraffin or any compound, product or residue of any of these substances.
(8) Chrome ulceration or its sequelæ	Any process involving the use of chromic acid or bi-chromate of ammonium, potassium, or sodium, or their preparations.
(9) Scrotal epithelioma (chimney-sweep's cancer).	Chimney-sweeping
(10) A localised new growth of the skin, papillomatous or keratotic, due to mineral oil	Cotton spinning by means of self-acting mules.
(11) Subcutaneous cellulitis of the hand (beat hand).	Mining
(12) Subcutaneous cellulitis or acute bursitis arising at or about the knee (beat knee).	Mining
(13) Subcutaneous cellulitis or acute bursitis over the elbow (beat elbow).	Mining
(14) Glanders.	Care of any equine animal suffering from glanders handling the carcase of such animal.
(15) Inflammation, ulceration or malignant disease of the skin or subcutaneous tissues, or of the bones, or their sequelæ or anæmia of aplastic type, due to X-rays, radium, or other radio-active substance.	
(16) Inflammation of the skin caused by radiant energy other than X-rays, radium or other radio-active substance.	

Compensation is payable in respect of the foregoing in three cases :—

(1) Where the Examining Surgeon for the district in which the workman is employed certifies that the workman is suffering from such a disease and is unable to earn full wages at his work.

(2) Where under rules or regulations of the Factories Act 1937 a workman is suspended on account of having contracted such a disease

(3) Where the death of a workman is caused by such a disease

In all these cases compensation is only payable if the disease is due to the nature of any employment in which the workman was employed during the twelve months previous to the date of disablement or suspension whether under one or more employers

Observations on the Scheduled Diseases

It will be observed that the second column of the Schedule sets forth a description of the process The Act however applies to any scheduled disease irrespective of the process out of which it is alleged to arise The process only becomes material for the purpose of Section 44 (1) Section 44 (1) provides that if a workman at or immediately before the date of disablement or suspension is employed in the process mentioned in the second column and contracts the disease set opposite to it in the first column, the disease unless the Examining Surgeon certifies that in his opinion it is not due to that employment is deemed to have been due to the nature of the employment unless the employer proves to the contrary It will thus be seen that the concurrence of the disease and the process, in the absence of a contrary certificate results in a presumption in favour of the workman If however the workman was not employed in the scheduled process the onus is on him to prove that the scheduled disease is due to the nature of his actual employment. There will be a similar onus upon him also in relation to those diseases opposite to which there is no process mentioned in the second column of the Schedule

The word "sequelæ" used in the Schedule signifies "symptoms or morbid conditions which either remain or supervene after a disease has run its usual course" (Quain's "Dictionary of Medicine").

With reference to "a localised new growth of the skin papillomatous or keratotic due to mineral oil" there is a special provision in the relevant order making it a condition precedent to compensation that at least one week before the date of the commencement of the disablement written notice shall have been given by the workman to the employer that application is to be made to the Examining Surgeon for a certificate of disablement, and notice, personally or in writing, is given to the Examining Surgeon that the workman is applying for such a certificate. Furthermore, compensation is not payable for more than fourteen days in all, unless the judge is satisfied that the workman is still disabled at the expiry of the fourteen days.

With reference to the dermatoses 3, 4 and 5 p. 333 no compensation is payable if the workman is disabled only for employment in the particular process in which the disease has been contracted, or other process involving risk of the disease, unless the judge, committee or arbitrator is satisfied that the disease has been contracted through long continued exposure to dust or liquids in the industry in which the workman was engaged at the time of disablement. The question of whether the disease has been contracted through long-continued exposure is one of fact.

Susceptibility to Recurrence

The tendency of dermatitis to recur has been discussed in the earlier part of this chapter.

The Act provides that the disablement or suspension is to be treated as the happening of the accident. It is the disease itself and not the disablement that is to be treated as the notional injury by accident so that the workman does not cease to be entitled to regard himself as having sustained injury by accident merely because his disablement ceases temporarily. He continues to be entitled to treat himself as suffering from an injury arising out of an accident so long as he suffers from the disease and will be entitled to compensation if the disease breaks out again, unless there has been a finding or a certificate of complete recovery.

Difficult questions, however, may arise as to the cause of the recurrence and the implications of that cause. If the recurrence is a recrudescence or continuance of the first attack the effects of which have not completely passed away then the workman's claim succeeds. If, however, the recurrence is due to the workman's own constitutional predisposition to the disease and his greater susceptibility to it, then the claim, founded as it is on the certificate of the Examining Surgeon, fails.

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The certificate must be a valid one and no order can be made upon one which is invalid.

It must be granted by the Examining Surgeon for the district in which

the workman is employed It is invalid if given by the Examining Surgeon for the district in which the man *resides but is not employed*

The certificate must be in the prescribed form and the disease named must coincide with the statutory description.

The Examining Surgeon must make a medical examination of the workman. He is not however limited to such examination but may make any necessary and suitable enquiries

The Examining Surgeon must state in the certificate the process in which the workman alleges he was employed, but the process need not be the one set opposite to the disease in the Schedule.

Appeal against the Certificate

In the absence of an appeal the certificate is conclusive as to the nature of the disease and the date of disablement.

An appeal lies at the instance of either employer or workman In the case of the employer s appeal it must be within ten days of the receipt of the notice of disablement or suspension In the case of the workman it must be within ten days of the receipt of the certificate. In either case, however the Registrar has power to extend the time by seven days

The appeal is to the Medical Referee appointed for the district who may be a Medical Referee appointed for a special class of case e.g., for industrial dermatitis

The decision of the Medical Referee is final and there is no appeal from it.

Considerable changes in procedure in relation to workmen's compensation will take place when the National Insurance (Industrial Injuries) Bill becomes law The scheme will run on a contributory basis and benefits will take the form of an injury allowance for the first twenty-six weeks after which should incapacity persist, there will be a disablement pension based on the character of the physical injury and not on loss of earning power There will also be allowance for dependants.

It will be the duty of the employee to notify a Government Insurance Officer giving particulars of the injury of the family dependants and supplying a certificate of incapacity from a doctor The employer should also notify the Government Insurance Officer

After investigation the Insurance Officer may authorise payment through the Post Office or he may refer the patient for medical examination or to a medical board Appeals may come before a local Appeals Tribunal or Medical Appeals Tribunal and the patient may be directed for medical treatment or rehabilitation or vocational training

Psychological complications consequent upon Medico Legal procedures

At present the benefits paid under the Health Insurance Act for sickness are often no more than half those paid for industrial injuries and the latter carry with them the possibility of a lump sum settlement or a pension This becomes a serious matter when it is recalled how difficult it may be to assume a dogmatic attitude in relation to an industrial etiology

It is our experience that many workers receive no monetary benefits for weeks and sometimes months after ceasing work where the cause of disability is questioned as being industrial in origin This is not necessarily the fault of the Act but for various reasons there may be delay in bringing the workman before an Examining Surgeon or before a Medical Referee for a decision upon appeal The delay is often a cause of distress and financial embarrassment to a workman.

It will readily be appreciated that these circumstances favour the superimposition of psychological complications upon any disability The course of any dermatological illness in a workman is commonly aggravated and the prognosis and tendency to relapse worsened by these influences.

GROUP 5

INFECTIVE DERMATOSES

CHAPTER XIX

AFFECTIONS CAUSED BY ANIMAL PARASITES

Scabies—Pediculosis—Tropical Diseases

ANIMAL parasites attack the skin (*a*) in search of food, *i.e.*, to suck the blood, (*b*) to deposit their ova, (*c*) on their way to the surface from deeper organs, and (*d*) accidentally

Parasites which attack the skin in search of food —

(1) Pediculi or phthirus, lice (2) Ixodes, ticks; (3) Leptus autumnalis, harvest bug (4) Pulex irritans, flea; (4) Cimex lectularius, bed-bug (6) Culex, gnat or mosquito (7) Pediculoides in grain itch (8) Tyroglyphus longior in copra and cheese itch, and various tropical parasites.

Parasites attacking the skin to deposit ova —

(*a*) Ova are deposited in the skin by (1) the Sarcoptes scabiei, the itch mite (2) Animal sarcoptes; (3) the Œstrus, gadfly (4) Pulex penetrans, jigger or sandfly

(*b*) Ova are deposited on the hair by (1) Pediculus capitis, the head louse (2) Phthirus pubis, the crab louse and (3) Pediculus corporis, body louse The last more commonly lays its eggs on the body linen.

Parasites attacking the skin on the way to the surface from the deeper organs —

(1) Cysticercus, hydatid, and (2) Dracunculus, the Guinea worm.

The skin is attacked accidentally by contact with certain larvæ, the hymenoptera, bees, wasps, hornets etc.

Scabies The Itch

(Lat., *scabere* to scratch)

Scabies is a parasitic, contagious disease caused by the Sarcoptes scabiei The characteristic lesions are the burrows produced by the female There is intense itching with a polymorphous eruption aggravated by scratching and often infected.

The Sarcoptes scabiei (Fig 160) (Gk., *sarx* flesh *kopto*, I cut) belongs to the Arachnidæ and the sub-order Acari and not to the Insecta. The parasite is frequently called the Acarus (Gk., *akari* mite). The female of pearly grey colour 400 μ by 300 μ, is just visible to the naked eye. The male is somewhat smaller 200 μ by 150 μ. The sarcoptes have eight short legs, the four anterior provided with suckers, the four posterior with bristles in the female; the fourth pair of legs bearing " suckers " in the male During life the suckers are flaccid sacs, the mechanism of which is obscure The larvæ have only six legs. The eggs are oval and of com

paratively large size, 150 μ by 100 μ. The impregnated female burrows her way into the horny layer of the epidermis where she lives for about two months and there lays her eggs, two or three a day The little tunnel thus produced causes a linear elevation of the skin from one-eighth to half an inch or more in length This is the "cuniculus or burrow" The ridge is greyish or even black in colour and in close proximity to it there is a small vesicle. On dissecting out a burrow and examining it under a low power the female sarcoptes is found at the distal extremity and behind her at intervals lie the ova, from a dozen to fifty in number the ovum nearest the orifice of the burrow being the first laid. There are also tiny black spots of the excrement of the acarus The ova hatch in from three to four days and the young embryos make their way through the roof of the burrow on to the surface where they find food and shelter in the hair

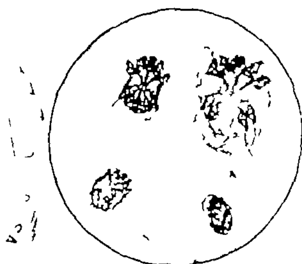
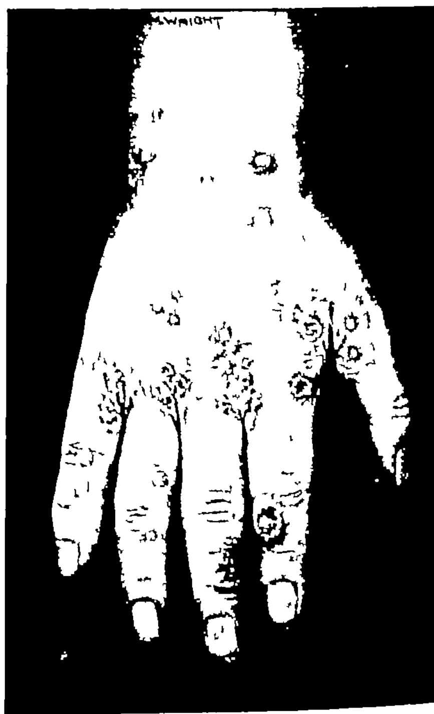


FIG 109 Sarcoptes. Male female, embryo, ovum. × 3.

follicles They reach the adult stage in four to six days The females having developed and being impregnated make their way into the skin and form fresh burrows Scratching may naturally convey the parasites from one part of the body to another The male acarus is rarely found, as it lives for a short time in a minute burrow but mostly on the skin surface in search of a female

Intimate contact is apparently necessary for contracting the disease Sleeping with scabietic persons is the usual cause but sleeping in infected beds or wearing infected clothing is a possible source of infection. Scabies is one of the commonest diseases in hospital practice but no class is exempt. In the cleanly it is frequently not thought of and may persist because appropriate treatment is not applied. In war scabies is so common as to interfere gravely with military efficiency and its incidence amongst civilians constitutes a serious problem in war medicine.

The investigations of Kenneth Mellanby have advanced our knowledge of the life history and the treatment of scabies. It is now clear that itching is not experienced until the victim has become sensitised to some product (? saliva) of the mite (scabin) This will be experienced from four to six weeks after the disease has been contracted The immature mites



SCABIES

wandering out of the burrows feed from secretions in adjacent follicles and sensitisation to the secretions or excretions which they deposit in these sites gives rise to the irritable follicular rash resembling a punctate eczema. Sensitisation at the sites of burrows gives rise to persistent urticated papules, "studs," about 2 to 5 mm. in diameter which may remain for weeks or months after the disease has been eradicated and may give rise to recurrent bouts of itching. The complete eruption seen in a fully developed case of scabies thus shows burrows, follicular pin head papules, urticarial papules ("studs") and commonly secondary sepsis and eczematisation. An eruption which can be diagnosed clinically as scabies will not be apparent until a period of six weeks or more after contact with an infected subject. In untreated cases the patient may after the course of many months, become immune to scabin and in



FIG. 170. Scabies. Burrows on the fingers.

consequence may cease to itch. We have seen this in a number of cases.

On the other hand, a patient becoming re-infected with scabies after a previous attack which had been cleared, may itch within a few days or hours of contracting infection as a result of his previous sensitisation

Symptoms. The burrows are characteristic, and in well-marked cases there are in addition, features which are so striking that a diagnosis can often be made on inspection. The eruption is polymorphous, consisting of follicular and urticarial papules, vesicles, excoriations, and pustules (Plate 37). The distribution of the lesions is a great help in diagnosis. The following areas should be inspected in order: The interdigital clefts, the ulnar aspect and the creases of the wrists and palms, the elbows and knees, the anterior axillary folds, the abdomen, flank and umbilicus, the folds under the buttocks, the penis, the breasts in females, behind and below the malleoli between the toes and on the soles of the feet, especially in infants (Fig 172). The lesions of scabies do not appear on the face, except in babies at the breast, the disease being contracted there from contact with an infected mother The itching is intense and is always worse at



SCABIES

severe that the whole body and limbs may be enveloped in crusts and scales, in which large numbers of the parasite are present (Fig 173).

Diagnosis of scabies. This is usually easy if the disease be borne in mind. Intense and especially nocturnal itching, often affecting more than one member of the household and associated with the characteristic distribution about extremities and girdles are the essential features. In private practice, however the disease is often overlooked because it is not



Fig. 172. Scabies in an infant. Note the plantar lesions.

thought of The burrows are characteristic, and from them the female parasite or the ova may be removed and recognised under the microscope. With practice the mite is readily removed from the end of a burrow by means of a needle. Alternatively in difficult cases a good method is to moisten the burrow with liquor potassae and to scrape it out with a scalpel transferring the whole of the scraping to a microscope slide, applying a cover slip and examining under the lowest power of the microscope. By this method an ovum is often found even when the acarus cannot be demonstrated.

night. The intensity of the eruption varies greatly with the amount of scratching. Impetigo of the phlyctenular and bullous types and weeping eczematous surfaces caused by scratching are common.

Scabies as seen in soldiers on active service differs in some respects from that usually met with in civil practice. Interdigital burrows are rare. MacCormac found them in only 13 per cent. of his cases. Vesication is more common and the hands are often quite free from lesions of any kind. Penile lesions are found in the majority of the patients, and may lead to a



Fig. 171. Scabies. Burrows on the palm.

suspicion of syphilis and it must be remembered that scabies is commonly contracted as a venereal disease. Secondary impetigo is usually severe especially on the buttocks, elbows and knees. Furuncles are common. There is lymphadenitis in many instances.

In the female burrows and excoriations due to scratching are very common on the breasts.

In severe cases there is eosinophilia and albuminuria may occur.

If unrecognised or improperly treated the disease may last for months.

In the variety known as Norwegian Itch the secondary lesions are so

rubbed in thoroughly with the palm of the hand all over the body and limbs, the neck and face being untreated. After an interval of twenty four hours the patient again takes a bath and scrubs the treated surface and then puts on *freshly ironed* underclothing An exactly similar treatment must be repeated after three days.

Technique for children. One ounce of tetmosol is mixed with four times the quantity of water and the solution is rubbed into the skin after a preliminary bath. The rubbing should be thorough, but the face and neck are left untreated. The diluted tetmosol is rubbed in daily for three days. Twenty-four hours after the last treatment the child is bathed and the surface scrubbed. Freshly ironed underwear is then put on.

Where the skin is broken a slight irritation may continue but is relieved



Fig 172 Norwegian or crusted scabies. (Reproduced by kind permission of Dr Wallace Beatty)

by zinc ointment Usually the itching ceases in a day or two after treatment Tetmosol soap is a useful prophylactic

Sulphur treatment. If benzyl benzoate is not available sulphur may be used After the bath the whole of the trunk and limbs is rubbed with unguentum sulphuris of the British Pharmacopoeia. The patient then puts on an old sleeping suit socks and gloves, and remains in them for twenty four hours, when the rubbing with ointment is repeated. Again the same sleeping suit, socks and gloves are worn for another twenty-four hours, when the rubbing is once more carried out. On no account should more than *three* rubbings with ointment be given. If irritation persists after this it is almost certainly due to the sulphur and for this a weak tar lotion—liq carbonis deterg ʒi, aq to ℥xx—should be applied.

The Danish treatment of scabies can be carried out with success in twenty-four hours. The details are as follows —The patient receives an ordinary cleansing bath and wipes himself thoroughly and afterwards rubs the whole of his body (except the head) with an ointment containing poly sulphides of potassium. A nurse or another patient helps him with the

Scabies may be mistaken for impetigo or for eczema and both these conditions may complicate the itch. In the male the presence of small scabbed lesions on the penis is a valuable diagnostic feature. A crusted sore on the penis may lead to a suspicion of syphilis, but there is no induration and *there are itching lesions elsewhere. Crusts on the buttocks are* a common feature in scabies.

In babies an eruption on the palms and soles is usually either scabies, strophulus or syphilis. In the itch the lesions are often pustular and burrows may be seen. The mother may also be suffering from the disease and should be examined.

Strophulus in infants and children may be difficult to diagnose from the itch *and both may occur together. The diagnosis is often easier in the* adult. The lesions of strophulus are primarily small wheals with a central papule but bullæ and vesicles are not uncommon and closely simulate the scabietic lesions of infants and small children. The eruption is most developed on the extensor aspects of the limbs and on the flanks and may occur on the face neck and scalp and there are no burrows. The absence of lesions on palms and soles (except in the bullous variety) is often a useful guide *and the absence of secondary sepsis is significant.* The intense pruritus of *pediculosis corporis* may suggest scabies, but the distribution is different. Scabies affects the extremities and the trunk, while the body louse affects the trunk and especially the shoulders. An examination of the underclothing will often demonstrate the presence of the pediculus.

Wallace Beatty and de Amicis remarked *that their cases of the* Norwegian type suggested neglected psoriasis from the heaping up of the *scales. The nails may be affected by subungual parasites.*

Prognosis. Cure is rapid if the treatment is thorough.

Treatment. The patient is smeared with soft soap and then lies in a hot bath for twenty to thirty minutes. The surface is then washed with the soft soap and unless the skin is delicate scrubbed so that the burrows may be macerated or opened up.

Benzyl benzoate treatment. There is no doubt that the simplest and most effective treatment for scabies is the emulsio benzyli benzoati (N.H.F.) *i.e.* benzyl benzoate 25 lanette wax 2 water to 100. This drug is mentioned in Radcliffe Crocker's textbook as a certain cure for scabies. It was revived some years ago in Denmark and has been widely used on the Continent.

It is sufficient for the emulsion to be thoroughly applied to the whole body but it *must be allowed to dry into the skin and must not be washed off for forty-eight hours.* One treatment is sufficient. Sterilisation of clothes is not essential but contacts should be treated and it is probably desirable to have a thorough bath before treatment as in the old fashioned but effective sulphur ointment routine. *Benzyl benzoate treatment* does not give rise to dermatitis as a rule, but may aggravate an existing eczema. It causes a transient stinging of sensitive parts such as the genitals and flexures and obviously does so in many infants and young children.

Tetmosol is a valuable remedy for scabies. It is a solution in alcohol of tetracetyl thyuram monosulphide. *It is put on the market by Imperial* Chemicals Pharmaceuticals.

Technique for adults. After a preliminary bath undiluted tetmosol is

they were frequently washed with carbolic soap. Some of the students developed secondary lesions on the trunk, thighs shoulders and upper arms. Rapid cure followed baths and the use of sulphur ointment, with disinfection of the clothes. When the latter precaution was neglected reinfection occurred. The sarcoptes were found on the carcase in abnormally large numbers. Burrows are not observed in animal scabies.

Sarcoptes of the camel frequently infects camel drivers and others who come closely into contact with these animals, and has caused much trouble in camel corps in Eastern campaigns. Dyson reported an epidemic in Palestine in 1919

Sarcoptes of the dog, recognised in 1814 by Gohier is not uncommonly conveyed to human beings. It is not difficult to make the diagnosis if one is aware of the possibility of infection. The eruption itches intensely and the lesions are minute vesicles or red follicular papules, but the characteristic burrows of the *Sarcoptes hominis* are not present.

Though the lesions are most common on the extremities, Sequeira had, some years ago, a lady under his care in whom the itching vesicles occurred round one side of the neck. She was in the habit of placing her toy dog on her shoulder so that it rested against the neck. The dog was found by the veterinary surgeon who examined it, to be suffering from sarcoptic mange. Canine sarcoptic infection rarely spreads widely in man and rapidly yields to treatment by sulphur

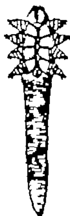


FIG 174 Demodex folliculorum (× 150).

Notoedric mange in the cat. The parasite of this affection, the *Notoedres felis* was formerly known as *Sarcoptes minor* It is smaller than the acarine parasites causing sarcoptic mange in horses, dogs and cattle and the impregnated female burrows her way vertically into the epidermis, laying there a packet of eggs. Kittens appear to be more severely affected than full-grown cats, and in them the disease may prove fatal. It may affect other members of the felidae, *e.g.*, a pet lynx. The lesions in man are intensely itching, pin head sized vesicles and an intelligent patient will often give a history of recurrent outbreaks at intervals of from six to eight days corresponding with the period of development of the notoedres. Personally we have not been able to demonstrate the parasite in the human lesions. Brushing the suspected animal over a clean sheet of paper and examining the dust microscopically will often reveal the parasite (Twiston Davies). In some cases notoedric mange in man is difficult to cure but it usually yields to sulphur

The Demodex folliculorum (Gk., *demos*, tallow *dex*, woodworm), a minute acarine parasite 350 μ long by 40 μ broad, lives in the large sebaceous follicles (Fig 174). It is rarely found in young children, but is always present in the adult. It is usually believed to be non-pathogenic but has been suspected of conveying microparasites into the follicles It appears certain that each species of animal has its own particular variety of demodex. In dogs the demodex produces a type of disease which is serious. The lesions are follicular and the

back The ointment (Marcussen's) must cover all the skin but hard rubbing is not desirable. After a quarter of an hour the patient goes to bed for twenty four hours at the end of which period he receives a second bath and fresh underclothing The method of preparation of the ointment is described in the Appendix (p 751). The success of the treatment depends on the development of H_2S The only drawback is the unpleasant odour "Kathiolan" is a proprietary ointment of this type.

Mitigal (Bayer) a yellow oil containing di methyl-di phenylene-disulphide may be used instead of sulphur It has the advantage that it rarely provokes irritation of the skin and can be continued until the patient is free of all irritation

Most other remedies depend upon the effect of sulphur and have no advantage over sulphur ointment. The patient may be swabbed all over with 10–20 per cent. liquor calcis sulphurata. Nascent sulphur is liberated in the skin and effects the cure

In Vienna Oppenheimer followed the bath with an application of an ointment combining 10 per cent. potassium carbonate and 25 per cent. sulphur and then kept the patient wrapped in hot wet blankets ('wet pack') for two hours while the clothes were stoved and one treatment was said to effect a cure

A rapid cure may be effected by the use of balsam of Peru, three parts, glycerine one part or in an ointment containing 12 per cent. of the balsam, applied all over the body after bathing at night. Three daily applications are usually adequate Powdered derris root rotenone (the active principle of derris) pyrethrum chlorine gas etc. have been employed in the treatment of scabies but most of them provoke dermatitis.

The clothing and bedding may as an extra precaution be disinfected by heat or by formalin and all contact cases must be treated It has been established that the wholesale disinfection of clothing and bedding by local authorities is uneconomical and unnecessary

Reference.—K. Mellanby 1943 Scabies. Oxford University Press.

Animal Sarcoptes Affecting Man

The Sarcoptes of the horse which has been known since 1856 (Delafond and Gerlach) was the cause of much trouble among the men of the mounted units during the (1914–1918) war Just as the medical service of the Army had to make special provision for the treatment of scabies in the men, the veterinary department had to combat widespread sarcoptic mange in the mounted units transport animals etc The men in charge of these infected animals were frequently attacked. Some cases of this type of infection are met with in private practice Sequeira saw a child and her governess, who had both contracted scabies from a pony An interesting epidemic was reported in 1922 by MacDonald The carcase of a horse which had suffered from generalised sarcoptic mange was used by a class of veterinary students, who spent from two to four hours on the subject. With the exception of onlookers and those engaged on the head and neck, which had been cured by treatment, all suffered from most pronounced and continuous itching Forearms ankles and arms were affected by a pin-head size fiery red, papular eruption The hands sometimes escaped, as

and about the ears or on any part of the face and neck, as well as enlarged glands of the occiput and neck in children, should always suggest pediculosis, and a careful examination for the parasite and nits should be made. The irritation and suppurative lesions cause enlargement and tenderness and often suppuration of the lymphatic glands of the occipital and cervical regions. Phlyctenular conjunctivitis and keratitis are common in patients suffering from impetigo due to head lice, the infective coccal organisms being transferred to the eye by rubbing. The affection is not infrequently associated with general or nervous debility.

In neglected cases there may be a distinctive unpleasant odour. In the worst type, called "Plica polonica," the hair becomes matted together into a thick mass under which crowds of pediculi swarm and propagate.

Treatment. It is comparatively easy to destroy the adult parasites,

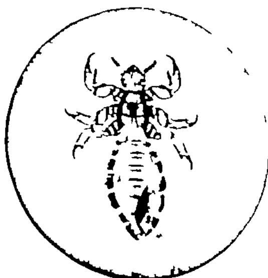


FIG. 173. Pediculus capitis. × 23.

but the nits are got rid of with difficulty. Even when the ova are killed the collar which attaches them to the hairs prevents their removal. It has recently been demonstrated that benzyl benzoate emulsion (ascabiol) loosens the nits and facilitates their removal and is of value as an insecticide.

An effective treatment, whether for children or adults, is the application of Lethane 384, 50 per cent. in a white oil. For children 2 c.cm. are required; for women with long hair 8 c.cm. This quantity is about equal to that of brilliantine commonly used. The hair is parted and the solution applied to the scalp directly in about eight places with a teaspoon or pipette and rubbed in with the fingers. The head should not be washed nor covered for eight to ten days. It has been observed that one application not only kills the lice but renders the host immune for a week. The lethane solution can be used for other hairy parts, but it is wise not to apply it to the scrotum. When lethane is not available a lotion of phenol 3 parts

demodex, in penetrating the follicle, carries with it the *Staphylococcus pyogenes aureus* This microbe sets up an obstinate suppurative folliculitis The disease is not highly contagious like sarcoptic mange but it runs a chronic course, and the coccal infection may become generalised with high fever and end fatally

We have seen a case in which the owner of a dog with demodex mange got a demodex folliculitis of his eyelids, and two cases of an itching eruption localised to the trunk, the lesions resembling small acne follicular papules, from which *demodex folliculorum* only was recovered.

Demodex impetigo in man. In some cases of circinate bullous impetigo Whitfield noted the presence of numerous demodex parasites at the edges of the lesions The etiological significance of this observation remains doubtful for the characteristic lesions of demodex are follicular and little support can be found for the view that demodex can produce bullous lesions Some authorities credit this parasite with a pathogenic *rôle* in some cases of pustular rosacea

Pediculosis

(Lat. *pediculus* louse)

Three varieties of pediculus are met with (1) Pediculus capitis (2) Pediculus corporis vel vestimentorum (3) Pediculus pubis (Phthirus pubis. Gk. *phtheirion*, louse)

(1) **Pediculosis capitis** The disease is caused by the pediculus capitis, or head louse (Fig 175) The parasite is of a greyish colour in Europeans, black in negroes, and yellow in the Chinese It is about one-twelfth of an inch long and about half as broad. The females are larger than the males and more numerous One female may lay 140 eggs, about four a day They are deposited in white, somewhat conical chitinous sacs (nits) attached to the hairs by a collagenous collar which renders their removal difficult. If a hair on which they are present be removed, it will be found that the nits can be pushed along the hair from the root to the free end, but not in the reverse direction From one to a dozen or more nits may be found on one hair (Figs 176 and 177) The ova hatch in from three days to a week and are mature in eighteen days.

Pediculosis capitis is much more common in children than in adults and in girls than in boys owing to the length of the hair It is one of the commonest diseases met with in hospital patients but is not infrequent in private practice. Should it be seen in children of a household where the hygiene is good, the nurse or other attendant may be the source of infection In boarding schools even of the better type it occurs probably from the general use of hair brushes etc The incidence of pediculosis capitis in elementary schools throughout the country especially in industrial districts is still disgracefully high.

Symptoms The pediculus itself does not give rise to any obvious lesions but its presence on the scalp causes irritation and consequently scratching The scratching produces excoriations which frequently become infected with pus-cocci Crusts and scabs form which mat the hair together The occipital regions and sides of the head are the commonest sites but the whole scalp may be affected Pustular lesions on the occiput

weeks, and of the female four weeks. If they can get no food they die in 7 to 10 days. The pediculus in searching for food crawls about the skin and sucks blood. Its puncture induces itching and consequently scratching. Linear scratch marks, especially about the scapular regions chest, waist, and hips, should lead to the suspicion of pediculosis and examination of the body linen for the parasite. Hæmorrhagic points and blood crusted papules present on the skin are caused by the bites of the louse.

The disease is commoner in the adult than in the child, and especially in the elderly. It is worthy of note that it may occur in the elderly of all classes, and failing sight may sometimes account for its being overlooked.



FIG. 177. Pediculosis capitis in an adult male. Showing nits on the scalp-hairs.

In Britain infection by lice is more frequent in the winter than in the summer.

Pediculosis corporis used to be of the highest importance in time of war. It was one of the greatest troubles in an army on active service and special attention had to be directed to the disinfection of the men's underclothing. It is well known that typhus is conveyed by body lice, and the fact that the British Army was free from this dire disease during the recent wars was largely due to recognition of the necessity of drastic measures directed to the extermination of body lice. In addition to typhus, trench fever was shown to be conveyed from one individual to another by the excreta of lice inoculated by scratching. The spirochaete of relapsing fever (*S. recurrentis*) is also conveyed by the pediculus corporis.

In the tramp and vagrant seen in poor law institutions and charitable shelters these conditions are much aggravated. The whole of the surface of the body may be deeply pigmented, the epidermis thickened and covered with scabs and crusts from secondary infection. These changes

spirit 25 parts and 1/1000 perchloride of mercury to 100 or equal parts of kerosine and a vegetable oil should be applied liberally to the whole scalp and hair which is then covered for twelve hours and subsequently thoroughly shampooed. Combing with a fine tooth-comb will remove the pediculi and if any living parasites are found the treatment must be repeated The removal of the nits is a tedious and uncomfortable business and requires a special comb such as Sacker's or the Durbac comb. Since dead nits are harmless and less conspicuous than scurf there is no need to remove them In dealing with school children it is important to examine the other members of the family and to disinfect pillows, etc., in the home. Rubbing a few drops of the lethane preparation into the scalp two or three times a week is a useful prophylactic measure It is rarely

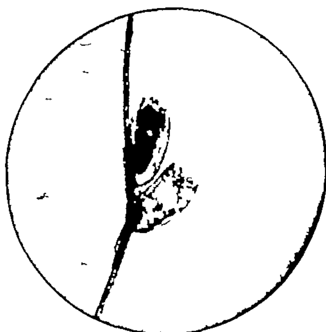


FIG. 176 Hair with nits attached.

necessary to cut the hair Should there be impetiginous lesions from scratching the phenol lotion or ammoniated mercury ointment soon removes them

The potent insecticide D.D T is likely to replace the older methods of treatment It is used in a powder or emulsion 2 to 5 per cent

REFERENCES—K MELLANBY *The Medical Officer* Feb., 1941 J R. BUSVINE and P A. BUXTON *Brit Med. Journ* 1942 i. 407 A. D FRASER 1946, *Brit. Med Journ.* 2 263

(2) **Pediculosis corporis** The pediculus corporis vel vestimentorum is the largest of the human lice (Fig 179) The male is 3 mm. long by 1 mm broad, the female 3 3 mm by 1 4 mm It varies in colour in different races, being dirty grey in Europeans black smoky orange and yellow brown in the darker peoples The parasite lives in the underclothing and the ova are laid on it and sometimes also on the fine hairs of the trunk, particularly about the neck and shoulders The ova, which are produced in enormous numbers, are hatched in a week. They develop from the larva to imago in eleven days The adult life of the male is three

issued on a large scale in the Army Hellier reported that body lice were found in only 1 per 1 000 a month in the personnel after the landing in

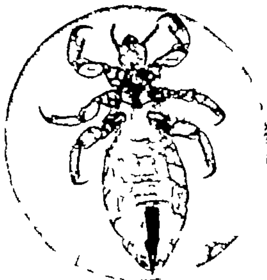


Fig. 179. Pediculus corporis. × 23.

Normandy He had, however found that some individuals developed a *purpuric eruption in areas that were pressed upon by the impregnated*



Fig. 180. Phthirus pubis.

shirt It appeared doubtful whether such a toxic effect could be due directly to D.D.T Underclothing treated with D.D.T powder is repellent to pediculi for several weeks.

are mainly caused by constant scratching and dirt. To this aggravated condition the name phtheiriasis is given. It is popularly called vagabond's disease.

Diagnosis Pediculosis corporis must be distinguished from scabies, from urticaria and from senile prurigo The characteristic distribution of the scratch marks about the shoulders etc., in an old person should suggest the affection at once The distribution of scabies on the extremities is a guide, and an examination should reveal the parasite. Urticaria should not be mistaken, as there are wheals.



FIG 178 Vagabond's disease.

Treatment. All the clothing must be disinfested and after a hot bath lotions of carbolic acid (1 in 60) may be applied to relieve the irritation.

Prophylaxis on active service. The clothing should be turned inside out and the seams examined. A hot iron passed along the seams will kill the parasites. Where facilities exist the garments may be disinfested by being placed in a *Thresh disinfector for three-quarters* of an hour or boiling water for five minutes Shirts impregnated with D D T were

issued on a large scale in the Army Hellier reported that body lice were found in only 1 per 1 000 a month in the personnel after the landing in

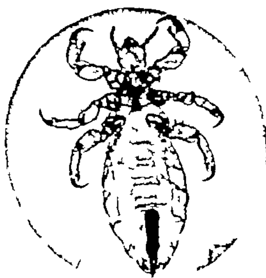


Fig. 179. Pediculus corporis. × 25.

Normandy He had, however found that some individuals developed a purpuric eruption in areas that were pressed upon by the impregnated



Fig. 180. Phthirus pubis.

shirt It appeared doubtful whether such a toxic effect could be due directly to D.D.T Underclothing treated with D.D.T powder is repellent to pediculi for several weeks.

Gammexane (666) in powder or spray is also highly effective.

(8) **Phthirius pubis** (Gk. *phtheirion*, louse) The phthirius pubis (Fig 180) affects the pubic hair and occasionally that of the axillæ the sternum, the eyelashes and eyebrows In a very neglected child the parasite spread from the eyebrows on to the hair of the anterior part of the scalp The nits, being of different colour from those of the pediculus capitis were quite easy to distinguish.

The crab louse is shorter than the other pediculi It is about one and a half millimetres long Infection usually takes place in sexual intercourse, but may be picked up in public conveniences Phthirius pubis is occasionally seen in private practice, usually in men, and may be classed as a venereal disease The chief symptoms are intense itching of the pubic regions with excoriations from scratching The nits are of similar shape and attached to the hairs in exactly the same way as those of the head louse They are, however brownish in colour while the scalp nits are white

On the eyelashes they form rows of tiny projections which on removal and examination under the microscope are seen to be fastened by a collar to the hair

Treatment is simple Ung hydrarg ammon should be applied to the pubic area and ung hydrarg ox flav to the eyelid margins It is important to remember that if too strong a preparation, such as ung hydrarg be used a mercurial dermatitis may be set up and aggravated by the continual application of the remedy The patient should therefore be warned against too vigorous treatment and after a few applications of a dilute mercurial or beta naphthol ointment a lotion of phenol 2 per cent in liq hydrarg perchlor should be used.

The underclothing should be disinfected. D D T is not entirely effective as a prophylactic.

Pulex irritans (Common Flea)

The common human parasite is the *Pulex irritans* which rarely affects dogs and cats The cat-flea (*Ctenocephalus felis*) and the dog flea (*Ctenocephalus canis*) occasionally attack man. The rat-fleas (*Xenopsylla cheopis* and *Ceratophyllus fasciatus*) transmit bubonic plague.

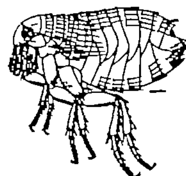


FIG 181 *Pulex irritans* Common flea. × 25 (British Museum. Economic Series. No. 3. Waterton, 1916.)

The flea lays its eggs in cracks between boards wainscoting, animals kennels birds nests etc. We have seen a plague of black fleas (*C canis*) on carpets and the insects immediately attacked the legs of persons entering the room

The bite of a flea causes a minute hæmorrhage into the skin, with a red areola. In some cases wheals form Flea-bites may be mistaken for the eruptions of the exanthemata or purpura The application of ammonia, thymol or carbolic relieves the irritation A useful lotion for

insect bites consists of phenol 2 per cent., tincture of iodine 10 per cent. in camphor water. As a prophylactic, pyrethrum is recommended. In infected houses the floors should be washed and "crude oil" emulsion, naphthaline or kerosene applied.

Cimex lectularius (Bed-bug)

The *Cimex lectularius* is the parasite met with in England. In warm climates another variety *C. rotundatus* occurs. The bed bug is 5 mm. long 3 mm. broad. It has a reddish-brown, wingless body. The eggs are white and 1 mm. long. The parasite appears to attach itself to human habitations and may migrate with luggage. Its disagreeable odour is caused by an oily secretion. The bug hatches in eight days, and it may

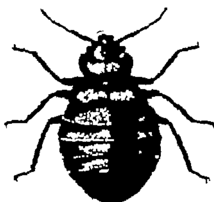


FIG. 182. *Cimex lectularius*. Bed-bug ♀ Actual size represented by line at side. (British Museum. Economic Series. No. 5. Bruce F Cummings, 1917.)

live for a year without food. It is known to convey the spirochaete of relapsing fever and the bacillus of plague and recently suggestions have been made that the *Bacillus lepræ* may be carried by it. Bed-bugs are mostly active during the night and with daybreak they return to their hiding places in the crevices of bedding, the hollow rails of bedsteads and behind wall papers, etc., so that their victim may be quite unaware of these nocturnal visitors. The lesions produced by the bug are more inflammatory than those of the flea and take several hours to develop. There is a central hæmorrhage where the blood has been sucked and, around it a wheal or papule which itches intensely and may last a week or two before it disappears. The treatment is the same as that described for the irritation produced by the flea. A stronger lotion for inflamed insect bites is: phenol. liq. ℞x, camphor gr. v, tinct. iod. mit. ʒii, aqua ad ℥i. We have also found the following ointment useful: Menthol gr. 6, pulv. camphoræ gr. 6, chloral hydrate gr. 7, vaseline to 1 ounce.

To free rooms and furniture from the parasite spraying with D.D.T., 5 per cent in kerosene is most effective The lethal effect lasts three *months* Fumigation with hydrocyanic acid or burning sulphur for four hours or longer used to be advised and benzene kerosene, and turpentine were applied locally

Bee Stings, Wasp and Hornet Stings

The glands that secrete the venom are found in the females under the last few abdominal segments in bees, wasps and hornets. They lie between the uterus and rectum and discharge into the proximal end of the sting The poison glands are of two kinds but their mixed secretions are injected by the sting The average dose from a bee sting is one milligram of venom Phisalix has shown that three elements can be distinguished (i) An inflammation producing factor which is responsible for the common bee sting (ii) a convulsant poison which does not pass through a Berkefeld filter and (iii) a stupefying and paralysing poison partly filterable

Symptoms. The symptoms in the human subject vary widely and idiosyncrasy is the most important factor in deciding their severity. A hardened beekeeper after being stung may show nothing but a few small painless transient papules, while another individual may be stung but once and die in a minute or two

In patients who react violently the most serious effects occur when the head face and neck (the most exposed parts) have been stung Violent pains of a burning character spread widely and itching paraesthesiae areas of anaesthesia and headache are common Urticaria, oedema, erythema, intense angioneurotic oedema may come on in a few minutes suggesting that histamine or a histamine like substance is liberated. In other cases the sites of the stings swell up and later become septic and even gangrenous. A sting on the arm or body may be followed by enormous swelling of the face

Intense muscular weakness muscular spasms or twitchings may occur The patient may also develop paralysis. Respiration is difficult and inability to swallow ocular palsies Cheyne-Stokes respiration, have been reported as having developed a few minutes after a sting Shock and collapse which may be profound, occur in severe cases and in rare instances have proved fatal As a rule, however there is rapid recovery Jex Blake points out that the phenomena closely resemble those of serum sickness and as there is frequently the history of previous stings, he looks upon the severe reaction as allergic and questions the usual explanation that the venom has been introduced into a vein.

Little is known of the nature of the poison in the stings of wasps and hornets. The venom of the hornet may cause fainting brady or tachycardia, a fall of temperature and diarrhoea and vomiting

Treatment. For bee stings any weak alkali ammonia soda even the blue bag of the cottager allays the irritation. For wasp-stings a weak acid such as vinegar is advised In cases attended with shock, if available coramine pituitrin or adrenalin should be given hypodermically Black coffee with half a grain of ephedrine or the injection of a few drops

camphorated oil have proved of service. Where no such remedy is available as often happens, artificial respiration should be started at once and has been known to save life.

References—M. Phisalix, "Animaux venimeux et venins," 1942, I, p. 330. A. J. Jex Blake, *East Afr. Med. Journ.* 1942, 19, 74, and *Brit. Med. Jour.*, 1942, 2, 241

Culex (Gnat or Mosquito)

Mosquito bites and gnat bites and midge bites are attended with the formation of erythematous spots or wheals. In certain subjects the number and extent of the lesions may lead to considerable swelling and sometimes to gross bullous lesions especially about the legs and may occasion some difficulty in diagnosis. The local application of ammonia solution or of the carbolic lotion will relieve the irritation. Cod-liver oil 10 per cent., phenol 5 per cent., and oil of citronella in a non-greasy base make a satisfactory application for both prophylaxis and treatment.

A modern prophylactic containing D.M.P. (dimethyl-phthalate) is the following emulsion

℞ Lanette wax, 5 gm.
Triethanolamine 9 c.cm.
Oleic acid, 27 c.cm.
Dimethyl-phthalate, 100 c.cm.
Water 100 c.cm.

D.D.T. or pyrethrum in kerosene as a spray disinfects premises, etc.

Ixodes (Ticks)

The wood-tick (*Ixodes ricinus*) is a minute parasite of the Acarus family. Its habitat is usually pine trees. It alights on the surface of the body and inserts its proboscis to suck blood. If not disturbed it may



Fig. 161. African tick. *Ornithodorus moubata.* (British Museum Economic Series. No. 6. Stanley Hirst, 1917.)

remain for several days, and when gorged with blood it drops off. Turpentine or paraffin applied to the head of the parasite kills it and it releases its hold. If forcibly removed the proboscis may be left in the skin and set up inflammation. The lesion caused by the tick is a small wheal.

Animal ticks, from dogs, sheep, camels, etc., occasionally attack man

The bite of the insect may pass unnoticed and the small head becomes firmly fixed in the skin while the distending body conceals it and resembles a pedunculated cyst. Such was the diagnosis in two cases sent to one of our clinics The tense body of the *tick may be pale yellow or more* coloured and attain a size of 0 5 cm. or more The skin lesions are usually trivial but some severe infections are conveyed by ticks, *e.g* the virus disease of Rocky Mountain spotted fever some cases of tularemia, and African tick fever

Leptus autumnalis (Harvest Bug)

The leptus is the larva of *Microtrombidium autumnale* and perhaps of other species It is of bright red colour and 3 to 4 mm. long It attacks the human skin usually in July and August The lower part of the legs and ankles are the areas commonly affected but other parts are not exempt.

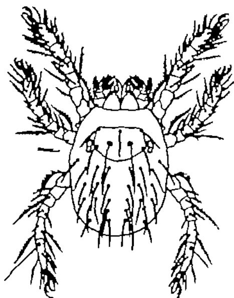


Fig 184 Harvest bug *Microtrombidium autumnale*. (British Museum Economic Series. No. 6. Stanley Hirst 1917)

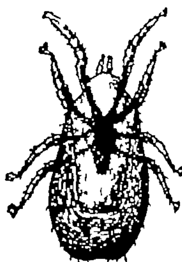


Fig. 185 *Dermanyssus Gallinae*. *Fowl mite.* (British Museum. Economic Series. No. 6. Stanley Hirst 1917)

The lesions are due to the burying of the head of the parasite in the epidermis Probably some irritant is introduced for violent irritation follows and red papules and wheals form. The scratching may lead to secondary lesions The best application is carbolic acid in olive oil or sulphur ointment. Dusting the lower limbs socks and shoes with sulphur powder is often effective against invasion

'Scrub Itch caused by Trombidia (harvesters) was a serious hindrance in the Far Eastern campaigns It occurs most during or just after the monsoon The areas usually infested are jungle and grass. Soldiers seated or reclining were most likely to be attacked Men on the march usually escaped The lower limbs were mostly involved. The best prophylactic measure was the wearing of boots and puttees, and avoidance of known infected areas The gravest feature was that in some districts the trombidia carried the *Rickettsia tsutsugamushi* the organism

causing "Scrub typhus" which had a considerable mortality and caused grave inefficiency in the personnel (*vide* p. 643).

Tetranychus telarius, a moth which lives in plane trees, often attacks gardeners pruning and others who come in contact with the fallen branches. The lesions of the usual irritant type rapidly fade.

Dermanyssus gallinæ, an acarine parasite in birds, occasionally produces a papular eczematous eruption on the backs of the hands of poultry men. It comes out at night and in such numbers as to destroy fowls. The poultryman is attacked when cleaning out the chicken houses (*vide* p. 383).

REFERENCE.—H. LAWRENCE. *Med. Journ. Australia*, 1925, 2, 16.

Grain itch. Acaro-dermatitis urticaroides (Schamberg). A dermatitis caused by the *Pediculoides ventricosus* or Aleurobius. The parasite feeds



FIG. 186. Pediculoides ventricosus (grain-itch mite). Gravid female. (British Museum. Leonardo Series. No. 8. Stanley Hirst, 1917.)

FIG. 187. Grain itch. Patient was one of a large number of dock porters affected, while unloading a cargo of cotton seed.

on the wheat-straw worm and the joint worm (varieties of Isosoma) and on the grain moth (Sitotropha). It attaches itself to the skin by its sucking discs and claws and apparently introduces some irritant. Most cases have been seen in persons using new straw-mattresses, but others have occurred

in men unloading grain, particularly barley Fig 187 shows the chest of a man under our care who was attacked with many others while unloading a cargo of cotton seed in one of the London docks. The eruption consisted of urticarial wheals papules and minute vesicles on the chest, arms, face neck and back The incubation period is from twelve to sixteen hours Pustulation may occur and in severe cases fever sickness and



Fig 188. Carpoglyphus passularum (fig mite).

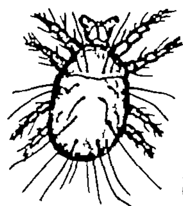


Fig 189 Eruption produced by Carpoglyphus passularum in a dock labourer unloading figs (Dr O'Donovan's case)

albuminuria have been reported. Removal from the cause and the application of soothing and antipruritic lotions are required

Grocers itch may be due to the same mites in grain or dried figs or to cheese mites a species of Aleurobius, which abound in the dried crusts of ripe cheeses The handling of such cheese may be followed by immediate irritation

Fig mite dermatitis Dr O Donovan found the *Carpoglyphus passularum* in decomposing figs which had produced intensely pruritic eruptions in eight dock labourers engaged in unloading a cargo of figs (Figs. 188 189).



(Dorsal aspect)

Fig 190. Tyroglyphus longior (copra-itch mite and cheese mite).

Copra itch is a dermatitis attended by intense itching caused by the *Tyroglyphus longior* (Fig 190) It occurs in persons handling copra, the dried kernel of the cocoa nut The hands, arms, legs and sometimes the whole body are studded with numerous intensely itching papules often covered with blood crusts due to scratching Papulo-pustules may occur The affection has been carefully studied by Castellani The incubation period is twenty four to forty-eight hours A 10 to 15 per cent beta naphthol ointment applied daily gives the most relief

Cheese-mite dermatitis due to *Tyroglyphus longior* resembles copra itch, and E. W Prosser Thomas 1942 reported cases occurring in dockers and railway loaders No doubt some of the cases of grocer's itch are due to this parasite

REFERENCE—E. W Prosser Thomas "Dermatitis due to Tyroglyphus Longior in Cheese Dust." *Brit Journ of Derm and Syph* 1942, 54, No. 12, 313.

Vanillism is an itching eruption occurring in those handling raw vanilla. It is caused by another variety of *Tyroglyphus*

RARER AND EXOTIC AFFECTIONS CAUSED BY ANIMAL PARASITES

Cysticercus of the skin. The cysticerci of *Tænia solium* and other tapeworms may reach the subcutaneous tissue and produce multiple (rarely single) tumours. The lumps are at first rounded and elastic and vary in size from a pea to a walnut. They usually occur on the trunk and extremities. The old cysts dry up, contract, and may calcify. There are no symptoms unless the size of the tumour tends to its irritation from friction, etc.

The importance of this condition has been emphasised recently by the observation that persons previously healthy who have lived abroad may develop epileptiform seizures from the presence of cysticerci in the brain. Subcutaneous nodules of the type mentioned may be a useful pointer to a correct diagnosis. Calcified cysts may be demonstrated by X-rays. The tumours have to be distinguished from lipomata, sebaceous cysts, gummata and new growths. A case in the London Hospital under Dr Wilfred Hadley suggested multiple fibromata. The history of the tumour, its elastic character and the finding of hooklets in the fluid evacuated by puncture are the points upon which a diagnosis is made. The tumours should be removed.

REFERENCE.—H. B. F. Dixon and D. W. Smithers. *Journ. R.A.M.C.* 1935, 64, 227, 300, 373; 65, 38, 91. Figures and numerous references.

Dracunculosis (Guinea worm). The female *dracunculus medinensis* (a variety of threadworm) is the cause of the disease. It is from twenty-five



FIG. 191. Cysts of dracunculosis. (From Dr Daniels' "Tropical Medicine.")

to thirty inches long. Like other parasites of its class, it has two hosts. It enters the human body in a minute crustacean, *cyclops quadricornis* or allied species, which lives in fresh water. In its human host a fresh cycle of development takes place. The worm becomes sexually mature and the

female when impregnated, starts to find her way to the surface of the body The male disappears Should the female escape from the body with the embryos or should the latter emerge and get into water the asexual cycle may start afresh and *viâ* the body of the crustacean the parasite may again reach its human habitat. The life of the Guinea worm in the human body is from nine months to a year The disease is only met with in the tropics. India, Central Asia, Egypt, Guinea, and other parts of the African continent furnish the patients seen in this country

The lesion is characteristic. A flat swelling forms on the surface of the body and in it the worm may be felt rolled up "like a coil of soft string. Sometimes the parasite migrates from one part to another The foot is the



FIG 102. Female Guinea worm under skin of forearm. (Photograph kindly lent by Dr Manson-Bahr)

part most commonly affected, but in India where water is carried in skins, the *bhisti* (carrier) is frequently attacked on the back from contact with the wet skin. Occasionally the worm presents on the scrotum When the worm comes to the surface a local inflammation with the formation of a bulla occurs and occasionally severe inflammation develops. In some instances the worm dies and becomes calcified. The diagnosis can only be made if the characteristic tumour is observed Ramsay however has devised an intradermal test, using an antigen prepared from an ethereal extract of the powdered worm Injection of the worm with lipiodol may give excellent radiograms There is a marked eosinophilia. The approach of the dracunculus to the surface may be attended with urticaria and a mild pyrexia.

Treatment consists in the injection of the area occupied by the parasite with a solution of perchloride of mercury 1 in 1 000 This kills the worm, which may be subsequently removed. If the dracunculus is in the act of emerging when first seen, the injection may be made to kill it and the worm may then be wound out. Douching the lesion with water for a fortnight or short spraying twice a day with ethyl chloride will cause expulsion of the embryos

REFERENCE—P MANSON BAHR "Tropical Diseases," 1942. Plate XXVII. p. 800 gives an excellent radiogram of worm injected with lipiodol

Anchylostomiasis (Gk. agkulos crook or hook) Hook-worm disease. Tunnel-worker's anæmia. A toxæmia with progressive anæmia caused by Nematode worms, the *Anchylostoma* (*Agchylostoma*) *duodenale* and the *Necator americanus* It occurs in the tropics and in mines and tunnels where there is a high temperature. Infection takes place by the mouth or through the skin. The cutaneous eruption caused by the embryos entering the skin is characterised by itching wheals, papules or vesicles which may develop into pustules and ulcers. In Cornwall the lesions are called "bunches." The eruption appears on the soles of the feet and lasts ten

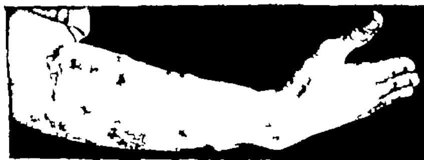


FIG. 183. A severe case of "bunches" on the arm of a Cornish miner (By courtesy of the Editor of the *British Journal of Hygiene*.)

to twelve days (Fig 183). Later there are leucocytosis and eosinophilia with anæmia, dropsy and fever The ova are found in the fæces.

Other nematodes causing cutaneous eruptions are the *Filaria Bancrofti*, producing lymphangitis with attacks of erysipelatous eruption (*vide*

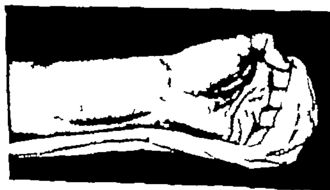


FIG 184. Loa loa (Calabar swelling). Photograph of wax model by Terzi. (By courtesy of the Wellcome Bureau of Tropical Research.)

Elephantiasis p. 182), the Loa loa, *Onchocerca volvulus* *Rhabditis niellyi*, and *Strongylus stercoralis*

The Loa and other species of filaria produce smooth, shiny raised tumours about five centimetres in diameter on the face, head, arms and ankles (Fig 184). The lesions, which are known as Calabar swellings, are

painless and last only two or three days but they may recur after the patient has left the tropics Subconjunctival thread like organisms may travel across the eye or form inflammatory papules in the skin.

Onchocerciasis Onchocerciasis is widely disseminated in West Africa (Sierra Leone Nigeria, the Gold Coast, Senegal, etc) It also occurs in the Sudan Uganda, Kenya Tanganyika, Nyasaland and the Congo, where among other tribes the pygmies are affected. It is probable that many of the conditions known as Craw-craw are of this nature.

The infecting organism is the Onchocerca volvulus a trematode whose intermediate hosts are the *Simulium damnosum* ("Ginja fly") and, less frequently the *S neavei* The disease therefore, is found chiefly in the riverside areas where the vector breeds though the fly has been known to travel forty five miles It is believed that prolonged residence in an infested area is necessary for its development. The adult worms are found in nodular fibrous tumours, sometimes over bony prominences or near lymphatic glands Usually two or more worms of both sexes are coiled in the tumour The disease runs a chronic course and may last for many years. In some individuals there is little disturbance of the general health. A high eosinophilia (up to 30 per cent.) is the rule. Hydrocele and elephantiasis may develop

Cutaneous onchocerciasis is found to affect a large proportion of the population in certain districts and at least two-thirds of these do not present nodular tumours The eruption is primarily papular Its common sites are the limbs, the buttocks the waist and back. Itching is intense and the consequent scratching causes secondary pyogenic infection. The chronic course of the disease leads to lichenification of the skin. At first this suggests morocco leather and later thickening and creasing are so marked that alligator skin seems a more appropriate description. The affected areas are deeply pigmented and the neighbouring lymphatic glands are swollen and hard

Diagnosis. In areas known to be infested this is easy but the practitioner arriving in a new district may suspect prurigo or scabies. In any suspicious case a shaving should be made from a papule and placed in normal saline and examined under the microscope. If the lesion is caused by the organism of onchocerciasis actively moving microfilariae are visible They are of two sizes one from 285 μ to 368 μ by 6 9 μ, and the other 150 μ to 287 μ by 5 7 μ.

Ocular complications In a small number of patients the eyes are involved and micro-filariae can be seen by the slit lamp microscope The conjunctiva or the retina may be affected and blindness (Sudan blindness) may follow No treatment appears to be of service though it is said that the removal of the parent tumours from the head and neck may prevent or relieve ocular infestation Cases of onchocerciasis with microfilariae in the eyes have been seen in Europeans

Preventive measures entail the destruction of the biting flies or of their habitat and are at present impracticable

REFERENCES—Symposium of Reports from different Colonies. *East African Med. Journ.* 1939 15, with account of the Simuliidae by W L. Gibbons p. 376. Strong Hissette *et al* *Amer Journ Trop Med* 1938 Supplement. Illustration of ocular conditions A useful review also appeared in the *Journ Trop Med Hyg* 1939 42, 12

Schistosome Dermatitis (Gk. *Skhizo* split, *soma* body). Both the *Schistosoma haematobium* and *S. mansoni* attack the human subject through the skin, the cercariæ entering the hair follicles. Bathers or swimmers are affected. The cutaneous affection has been recognized in parts of North America where the infestation takes place on bathing beaches. Schistosomiasis in the tropics is more commonly contracted from bathing or paddling in fouled streams. The eruption is an urticaria which disappears in half an hour and is followed by minute macules. There is intense itching and in less than twenty-four hours papules develop. Pustulation, probably from secondary infection, may occur. The dermatitis subsides in about five days. F. J. Wright and J. L. Roberts reported a case of larva migrans from infestation with *Schistosoma mansoni* (p. 384). A more serious but rare affection is the extension of the polypoidal condition of the mucous membrane of the bowel to the anus or of the bladder to the vulva. This may simulate condylomata or venereal warts or even esthiomène (poradenitis, lymphogranuloma inguinale).

Craw-Craw is the name given to several varieties of itching eruption on the West Coast of Africa. It would seem that prurigo and scabies are included. The most characteristic affection, however, is the eruption caused by the *Onchocerca volvulus* (*vide supra*).

Coolie-itch is a refractory affection attended by intense itching and a papular, vesicular or pustular eruption. It occurs in coolies employed in low-lying tropical regions. A nematode worm has been found in the lesions. The most efficient treatment is the opening of pustules and scraping any ulcers that may have formed. The surface is cleansed with a lotion of 1–1,000 perchloride of mercury; the parts are then dusted with boric acid powder and lint spread with boric acid ointment is applied.

Water itch is a vesicular eruption affecting the feet of coolies in the tea gardens of Assam in the rainy season. The cause is a mite, *Rhizoglyphus*, which it has been found impossible to eradicate from certain plantations.

Tydeus molestus was imported into an estate in Belgium in guano. It reappears yearly and produces intense pruritus in men and domestic animals and fowls. No remedy has yet been found for it.

Lyponyssus bursæ is found in the tropics, and is carried by birds. Houses become infected with the parasite (*cf.* Dermanyssus gallinæ) and human beings are attacked. A troublesome outbreak was reported in Sydney, N.S.W. (*vide* p. 877).

Lyponyssus bacoti, a rat parasite, produces similar outbreaks in the United States.

Myiasis is the name given to the invasion of the skin by the larvæ of the Œstridæ (gadflies or botflies). The lesions are suppurative and resemble boils. The actual parasite differs in various parts of the world. In tropical America the maggot is the larva of the *Dermatophilus cyaniventris*, in Africa the *Cordylobia anthropophaga* or Tumbu-fly, in Asia the *Sarcophaga ruficornis*, and in Europe the *Gastrophilus nasalis*. The larvæ develop in the skin of some warm-blooded animal or in man. The stigmata of the embryo are seen at the orifice of the boil. Removal of the parasite by forceps and local antiseptic are recommended.

Myiasis linearis or Larva migrans (Creeping eruption). A linear eruption produced by the larvæ of the Gastrophilus and other parasites. The clinical features are the development of a narrow raised red line, ⅛ to

1 inch broad and several inches long and generally sinuous. The line extends at one end while the opposite extremity slowly fades. The affection may last for several months to two or three years. There is intense itching

Castellani and Chalmers describe a *dermatitis macrogyrata* of the palms, the lesions being scaly and crusted and forming large rings. Lead lotion appears to be the best application.

In July and August, the cool weather on the East Coast of Africa tempts many people to enjoy a holiday at Mombasa and other resorts on the Indian Ocean, and it is common to see cases of "Larva migrans" among the visitors. Sometimes several members of a family are affected. The disease is caused by the invasion of the skin by the larva of *Anchylostoma braziliense* the common nematode of cats and dogs. The parasite is picked up on the sandy beaches while lying or walking about with bare feet and legs. Naturally the lower extremities are most often attacked but no part is exempt. In some instances a burrowing fly larva is the offender

The lesion consists of a wavy red line in the skin which may turn and cross itself but never forks. It is the track of the larva burrowing the skin. The advance of the parasite is about an inch in twenty four hours. Its presence causes intense irritation. Secondary infection from scratching is common. As previously mentioned Wright and Roberts reported a case of larva migrans in Kenya due to Schistoma mansoni. Progress was 2 inches per hour. Eosinophilia of 90 per cent was present

South African Sandworm. N. L. Murray of Durban described a form of "creeping eruption" which is common in Natal and Zululand. Though infestation is said to occur most commonly at the seaside it has been seen in gardeners away from the coast. The naked eye characters are somewhat similar to those described above but the tortuous course of the burrowing of the parasite in the superficial skin is shorter. The raised lines are about ⅛ inch wide. They are most frequent on the feet and legs, but any part may be affected including the genitals. The buttocks are a favourite site. The eruption itches intensely and secondary sepsis from scratching is common. Murray found the parasite to be a mite 800 μ long and the ova which are laid in the skin are only a little bigger than a polymorphonuclear leucocyte. Both natives and Europeans are attacked, particularly children. Treatment is on the same lines as that of scabies.

REFERENCE—N. L. MURRAY *Brit. Med. Jour* 1930 I 1020. Plates.

Treatment. It is important to remember that the parasite is to be found a few millimetres *beyond* the advancing end of the line. The organism can be dissected out under local anæsthesia after the part has been cleaned with cedar wood oil. A dissecting microscope is required. More generally the treatment is on the following lines :—

(1) To freeze the same area thoroughly with ethyl chloride spray. This is often successful and is indicated when there are several infestations in the same patient. This measure is advised by Kirby Smith from an experience of 5 000 cases. We have found it the best treatment

(2) The injection of a local anæsthetic in the vicinity of the end of the

track and ahead of it, and excision of a piece of skin about ¼ inch square. If carefully done this is effective.

(3) To cauterise the area after cleansing with alcohol and clearing with cedar wood oil and injecting a local anæsthetic. Bayley suggests that 7½ grains of sulphanilamide be given on two successive days to counteract any secondary infection.

Tunga penetrans (Jigger flea, chigoe). This small parasite is the cause of much disability in some tropical countries. It has been known in South America since the sixteenth century. The name "chigoe" is of West Indian origin. In 1872 the jigger was brought to West Africa (Angola) and the disease spread rapidly into the interior probably in the trail of explorers. Many parts of the African continent are now affected.



Fig. 113. Jigger lesions on foot in an African. Deformity of toes from old disease. (Photograph kindly lent by Dr. J. C. Carothers.)

Madagascar and the Seychelle Islands are infested, but the parasite has never thriven in India. Europeans suffer equally with the indigenous population.

The adult male *Tunga penetrans* closely resembles the common flea. The female until impregnated, is a free living blood-sucker. When impregnated she jumps on to the naked foot of a human being and having taken a meal of blood, burrows head-first into the skin until her last segments are flush with the surface. The fertilised eggs develop rapidly and the abdomen of the parent distends in a week, from 1·2 mm. to 6 mm. in diameter (Fig. 107). The ova are expelled singly and from 150 to 200 are deposited on the floor or on the ground in a week to ten days. When oviposition has finished the jigger dies and the dried up remains are removed by sloughing of the skin. The ovum is less than half a millimetre long. It enters the larval stage, a minute caterpillar, in three to four days. It protects itself by weaving a fine silken cocoon, and in about a fortnight reaches the pupa stage. It may remain dormant in dust for a period or emerge in about a week.

Clinical features The patient's attention is called to the infestation by itching which is worst at night. Its commonest site is about the nails of the toes On inspection a minute black spot may be visible Later the area becomes swollen, red and inflamed and there may be evident suppuration. The globular body of the parasite may be easily visible. In neglected cases there is a paronychia (In East Africa the same name is applied to the "jigger" as to a whitlow) We have seen many cases of multiple infestation even in Europeans In some cases we have observed a mild pyrexia before there has been evidence of secondary infection. In many parts of Africa most of the natives show deformity of the toes from destructive inflammation due to jiggers.

Prophylaxis Cleanliness of rooms and the removal of dust are important. Special precautions should be taken when the ground is disturbed by new building or opening up soil with the employment of



Fig 190. Pulex penetrans (Jigger) female (Kindly lent by Dr Castellani.)

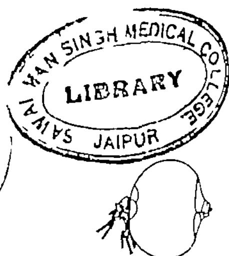


Fig. 197 Jigger Impregnated female × 10 (Blanchard).

native labour Wearing boots is a safeguard and was adopted for African troops during the recent war Regular inspection of the feet by medical officers is necessary for the African soldier is usually anxious to discard heavy footwear

A cheap disinfectant for floors is recommended by Prof Waterson Three parts of soft soap are thoroughly melted in 15 parts of water and while still hot 70 to 100 parts of kerosene or paraffin are added gradually with much stirring and shaking The final mixture should be creamy with no free oil. For use 1 part is added to 20 of water

Treatment. Early removal of the parasite is imperative This is effected by a needle the black spot being the guide. Many Africans have attained great skill in this procedure If the parasite is more mature and consists of a bag of eggs removal may be difficult without breaking the cyst. Secondary infection often follows such rupture In infected cases we have found a saturated magnesium or sodium sulphate-glycerine compress most useful When employing a native servant to remove a "jigger" it

is imperative to insist on absolute cleanliness, sterilisation of needle, etc., and to see that the parasite is burned.

REFERENCES—R. M. GORDON. *Lancet*, 1941 **2**, 47 Literature.

Black fly dermatitis. The black fly (*Simulium venustum*) produces a haemorrhage by its bite but for several days to some weeks a papulo-vesicular lesion persists. The surface weeps and heals with a thin scar. There is intense itching, heat and burning. Grouped bites form confluent lesions with much oedema. The glands are enlarged.

Brown-tail moth dermatitis. The brown-tail moth (*Euproctis crysorrhoea*) has attracted attention in the United States and Canada as destructive to fruit trees and in its larval state (May–June) as a cause of dermatitis. Cleland in Australia found that the *Euproctis Edwardii* caused similar trouble. The first symptom is itching occurring half an hour after exposure. This is followed by an eruption of erythematous or urticarial type. The lesions are the size of a pea, raised and firm. They may occur in groups or coalesce into patches. The arms and upper part of the trunk are involved, and the eruption may last for a few days to several weeks. Mild toxic symptoms may develop.

The nettling hairs of the larvae are the source of the irritant. A lotion of perchloride of mercury, 1 in 2,000 followed by painting the part with collodion, is recommended.

Handling plants or vegetables in which the hairs have been embedded is the cause

Habaswein itch. This name was given to a widely prevalent eruption met with in the Northern Frontier of Kenya during the recent war. It appeared to be peculiar to the Habaswein area. More European than African soldiers were attacked but there seemed to be no immunity. The eruption was seasonal, occurring mostly in September. The lesions have been likened to those of dermatitis herpetiformis. It was intensely itching and polymorphic. Erythema, papules and myriads of small vesicles in clusters formed with excoriations and pustules from secondary infection. The lesions lasted from three to five days and recurrences were common. Some pigmented stains were left especially after secondary infection. Allergic reactions of an urticarial type relieved by adrenalin or ephedrin, occurred. Habaswein itch was the cause of much inefficiency in the troops though the constitutional symptoms were not severe. B. J. P. Becker from experimental studies on volunteers attributed the affection to the local and toxic effects of the shed hairs of certain lepidoptera. The exact species were not identified.

Scorpion sting. There are many species of scorpion (Tityus) more than thirty-eight being recognised in Brazil alone. The poison is in the tip of the tail. The lower limbs in man are attacked in about a quarter of the cases, the upper in more than half. The sting is painful and the pain soon becomes intense. Cardio-vascular symptoms may develop rapidly. A painful lymphangitis with glandular inflammation is an early phenomenon. The whole of the affected limb may become livid. In rare cases there may actually be gangrene. The general symptoms are those of a neuro-toxaemia affecting the respiratory centre. Alterations of pulse rate are common, both tachycardia and bradycardia being observed. The sting may prove fatal.

Sea anemones. Sea anemones of the genera *Hellenopolypus* and

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Fig. 106. Pulex penetrans (Jigger) female. (Kindly lent by Dr Castellani.)



Fig. 107. Jigger. Impregnated female × 10 (Blanchard).

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Jelly fish (Medusæ, sea nettles) On the shores of the Indian Ocean the *Portuguese man-of war* (Physalia) may cause an eruption in bathers by contact with the tentacles which carry stinging capsules. The dermatitis may be severe and urticaria is a constant symptom. Another medusa, *Obelia* has stinging capsules in the ectoderm Contact causes the extrusion of a thread at the base of which are minute poisonous barbs. A painful local swelling is the result, and an urticarial eruption follows. In some cases shock and collapse occur as after bee-stings. Adrenalin injections are advised

Sea-urchin (Tripneustes esculentus) The spines of this echinus, known in Barbados as the sea-egg may cause suppuration if not completely removed The complication may be prevented by administering sulphapyridine (Earle)

Stinging fishes The *Weever fish* is found off the British coast in two varieties the greater weever (*Trachinus draco*) and the lesser weever (*Trachinus vipera*) The latter lives in shallow water and often stings paddlers and shrimpers The sting is in the spine of the anterior dorsal fin. Acute pain and inflammation follow and hæmolytic staining may occur

The *sting-ray* (Trygon pastinaca) and the *spiny dog-fish* (Squalus acanthus) may also attack man

Treatment. The injection of a few drops of 5 per cent solution of potassium permanganate is recommended and adrenalin in the more severe reactions

REFERENCE—H MUIR EVANS, Sting-fish and Seafarer 1943, Faber and Faber

Snake Bites

Adder bite The bite of the adder (*Vipera berus*) is serious in about half the cases The special local features are a spreading hæmorrhagic œdema and the double punctures of the bite The general symptoms are the result of vasomotor and psychical shock The extremities become blanched and cold the blood pressure falls and the pulse becomes thready Muscular weakness ataxia blurred speech and vomiting may occur early Later there is inability to swallow saliva dribbles from the mouth breathing becomes shallow and slow and in fatal cases cyanosis coma and convulsions are terminal The critical period is the first twelve hours

Treatment A tight tourniquet should be applied above the bite to arrest the circulation as completely as possible The bitten area should be excised suction applied (by mouth if necessary) and permanganate solution or crystals rubbed in Intravenous injections of specific antivenene should be given if available early The usual methods of treating shock are also indicated

Appendix on Insecticides and Insect Repellents

The late war saw the introduction of many advances for the protection of the troops serving in tropical and sub-tropical areas from infections caused by insect

vectors. The knowledge thus acquired must be of great value to civilian doctors practising in these regions; but animal parasites are far from negligible in temperate zones and the new remedies will have a wide field. In the following paragraphs we shall deal with the more important.

Pyrethrum has long been in use. It acts rapidly and has been mostly employed against the mosquito in malarious areas. The amount of the pyrethrins in different samples varies, and the lethal effect is rapidly lost. The solution must be kept in the dark. A commonly used preparation is made by dissolving one pound of pyrethrum powder in a gallon of kerosene. This is applied as a spray. It is best used combined with D.D.T., which has a more lasting effect.

D.D.T. (dichlor-diphenyl-trichlorethane) has proved of enormous value. It acts more slowly than pyrethrum but its lethal effect is much longer. In minute concentration it kills mosquitoes, adult flies, lice, bed-bugs, etc. It does not destroy ova, *e.g.*, the "nits" of lice, but all larvæ are killed on their being hatched. Walls of a building or room adequately sprayed with D.D.T. solution may be freed from flies, etc., for three months. Clothing impregnated with it is kept free from lice and remains so even after being washed two or three times. D.D.T. is used (1) as a powder 5–10 per cent. mixed with an inert medium such as chalk and kaolin. This can be applied by proper apparatus to infested persons without removing the clothes; (2) as a spray 5 per cent. in kerosene; (3) as an aerosol, etc. In practice a useful combination is *5 per cent. D.D.T. in the pyrethrum spray mentioned above.* D.D.T. is useless against the "itch" mite (Buxton) and has little effect on ticks. Used as directed the drug is harmless to man.

Gammexane ("666") benzene hexachloride, is said to be more powerful than D.D.T. but its lethal effect is less lasting. It is useful against the parasites enumerated and also against ticks.

Lethane (*n*-Butyl-carbitol-thiocyanate) kills head and body lice and the phthirius pubis. It may cause smarting and may be replaced by D.D.T.

Lauryl-thiocyanat is a valuable insecticide but the newer preparations seem to have replaced it.

Benzyl Benzoate is largely used in the treatment of scabies (p. 363).

Tetmosol (tetracetyl-thyriam monosulphide) has also proved of service against the "itch" mite (p. 363).

Sulphur in various forms long held prior place in the treatment of scabies (p. 363).

Derris (Rotenone) will probably be largely replaced by the drugs already considered. In combination with naphthalene it proved valuable in the late war.

Di-methyl-phthallate is perhaps the best insect deterrent. It is of special utility against mosquitoes, flies trombidia "harvesters," etc. and against the troublesome "jigger" (chigoe) of tropical countries. It is used undiluted a few drops being rubbed on to parts exposed to infestation. *It must not be applied to the eyelid or the lips.* Effective ointments containing it are available.

The di-methyl phthallat is *often* used in combination with D.D.T. and pyrethrum in a spray or in an emulsion (p. 378).

Di-butyl-phthallate has similar properties. *It kills mites.*

Oil of citronella has long been used as a repellent.

Aktinon cause an eruption of itching vesicles and pustules by contact with their tentacles The subjects are sponge-fishers In some instances there are *general symptoms* including nausea and vomiting The trouble is relieved by washing with a weak acid such as vinegar and the application of a bland oil

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Microsporon audouini.



Trichophyton crateriforme endothrix.



Trichophyton gypseum.



Trichophyton acuminatum endothrix.



Achorion schönleinii Favus.



Achorion quinckeanum Favus.

Fig. 199 Cultures of fungi.

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Mediterranean countries. The M. felineum seems to be the only one recognised.

(2) The trichophyta may be classified as endothrix and ectothrix varieties. The endothrix trichophyta (Gk. *endo* in *thrix*, hair *phuton* plant) (Figs 199 200) (Trichophyton endothrix) These fungi are believed to be peculiar to man. They cause ringworm of the scalp, body and beard, and

CHAPTER XX

AFFECTIONS CAUSED BY VEGETABLE PARASITES

Ringworm—Favus—Moniliasis—Actinomycosis—Blastomycosis—Sporotrichosis and Tropical Mycotic Infections

THE labours of Sabouraud in *Paris* and of *Colcott Fox* and *Adamson* in this country have extended our knowledge of the fungi which attack the human skin and hair to a remarkable degree. The differentiation of the various species of fungi is made by cultures on Sabouraud's maltose medium—water 1 000 crude maltose (Chanut) 40 granulated peptone (Chassaing) 10 gelose 10 Four groups with many individual species are distinguished They are (1) the Microspora, (2) the Trichophyta, (3) the Epidermophyta, (4) the Achoria which might be included in Group 2

(1) **The microspora.** The commonest in this country is the *microsporon*

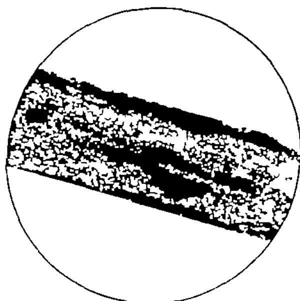


Fig 198. Microsporon audouinii. Microphotograph of infected hair ⅙ obj.

audouinii (Fig 198) It is peculiar to the human race, and is very rare after puberty It causes both scalp and body ringworm. When attacking a hair it forms a mass of closely packed small spores resembling a mosaic around the shaft. The mycelium may appear to be scanty because it is often obscured by the clinging mass of spores but it usually forms a net work of long branching filaments surrounding the hair shaft. Grown on Sabouraud's proof medium the cultures of M audouinii are snow white downy discs with a central tuft or knob (Fig 199)

Microspora of similar type have been found in the cat, dog horse, and guinea pig The most important of those attacking the human subject are M felineum, M lanosum (vel canis) M. equinum Both the hair and the glabrous skin may be affected The microspora appear to be very rare in



Microsporon audouini.



Trichophyton crateriforme endothrix.



Trichophyton gypseum



Trichophyton acuminatum endothrix.



Achorion schönleinii Favus.



Achorion quinckeanum Favus.

FIG. 198. Cultures of fungi.

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(3) The trichophyta may be classified as endothrix and ectothrix varieties The endothrix trichophyta (Gk *endo* in *thrix*, hair *phuton* plant) (Figs. 199 200) (Trichophyton endothrix) These fungi are believed to be peculiar to man. They cause ringworm of the scalp, body and beard, and

occasionally of the nails. The spores are slightly larger than those of the microspora but the special point of distinction is their arrangement in chains They are found inside the hair (endothrix) The mycelium is tubular in appearance The affected hairs do not fluoresce under Wood's filter The common varieties are —

T crateriforme
T acuminatum
T sulphureum
T violaceum

and T cerebriforme, which is placed in the endo-ectothrix group because infected hairs have more external spores than are seen with the other endothrices The names are descriptive of the cultures.

Some varieties are curiously local in their incidence e.g one neo-

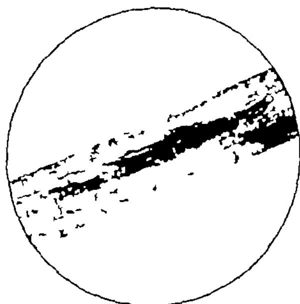


Fig 200 Endothrix trichophyton. Microphotograph Note that parts of the fungus are unstained ⅙ obj

endothrix plicatile is common in Denmark but rare in England and France *T violaceum* is the usual fungus found in Egypt *Other trichophyta are* almost unknown in that country

The ectothrix trichophyta (Gk *ekto* outside) (Fig 201) (Trichophyton endo-ectothrix) *These fungi are derived from animals (horses, cattle pigs deer* cats and dogs) and birds They are communicable to man and from one human subject to another either directly or indirectly They cause *ringworm of the body beard and nails, and occasionally of the scalp* The spores are arranged in chains and the mycelium is made up of jointed rod The common varieties of the ectothrices are —

T gypseum (granulosum and radiolatum).
T felineum
T roseum
T album
T pedis
T purpureum

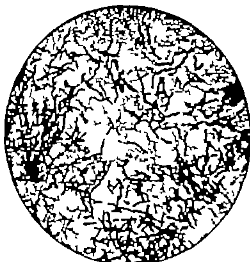


Fig. 201. Ectothrix trichophyton in scraping (stained). (1/6 obj.)

Fig. 202. Epidermophyton inguinale in scrapings. Kindly lent by Dr. Sabouraud.

of the patient and upon certain qualities of the individual skin including the pH which are conditioned by the secretions For example, *microsporon furfur* the cause of tinea versicolor is perhaps the most benign type of human ringworm and gives rise to scaly café au lait coloured macules with no ringed pattern and little or no erythema as a rule, although if the skin becomes hot and moist a bright erythema may develop The lesions of *microsporon audouini* the most common scalp fungus in children, are often seen as pale scaly discs on the neck shoulders and face the ringed pattern being absent in other cases the same organism produces well marked circinate lesions of deeper colour showing the characteristic ringworm features viz. a tendency to heal in the centre with the disappearance of colour and scale, and a well defined advancing edge erythematous, scaly and inset with shallow vesicles or deeper pustules The microspora of



Fig 207 Epidermophytosis of the hand and wrist Female at 12.

animal origin e g., M lanosum usually produce more inflammatory lesions, the edges being deeper coloured and vesicular or pustular The epidermophyta also give rise to pale scaly circinate lesions with considerable variation in the inflammatory reaction, while the trichophyta usually of animal origin are apt to produce deeper lesions inflamed and pustular but still showing the circinate arrangement resulting from peripheral extension. In the most virulent types grouped pustules are set in an œdematous, inflamed area but although resembling an acute pyogenic lesion the pustular ringworm runs a chronic course and lymphangitis is absent. The fungus is difficult to demonstrate in the purulent ringworms but easy in the scaly and circinate varieties (see Plate 38)

The scaly edge of the patches or rings should be wetted with a 10 per cent. solution of caustic soda or potash and after a minute the softened scales may be scraped up with a scalpel and transferred to another drop of potash solution on a slide to which may be added one drop of a 1 per cent solution of phloxin if it is desired to stain the mycelia A cover slip is

PLATE [illegible]



[illegible] RINGWORM

The lesions are vesico-pustules arranged in concentric rings. The patient was a groom.

[To face p. [illegible]]

pressed on the scraping and the preparation examined under the high dry power of a microscope It is necessary to adjust the iris diaphragm carefully if unstained films are to be successfully examined, for recognition of the fungus depends upon its slightly different refractability from that of the cells in which the mycelium lies If ointments have been applied the grease should be removed with ether before applying the potash solution, but the examination of treated lesions is often disappointing The mycelium is recognised as a finely granular thread, very uniform in thickness, running through cells and perhaps branching or showing rounded or bulbous ends. The appearance is suggestive of fine glass tubes. These features differentiate the fungus from its imitations produced by the overlapping edges of horny cells which on re focussing are seen to have a mosaic pattern. The larger fibres of cotton and wool ought to present no real difficulty to the examiner

Diagnosis of ringworm of the glabrous skin. The diagnosis is usually easy on account of the ringed character of the lesions. It will have been noticed, however that some of the microsporon lesions are in the form of flat scaly discs, and these are usually associated with tinea capitis. The term "circinata" must not mislead the student. Psoriasis and certain syphilitic eruptions sometimes occur in rings, but those of psoriasis are covered with silvery scales, and there are usually characteristic patches on the elbows and knees. The syphilitic eruptions are polymorphous and their colour is distinctive, and there are usually other general symptoms to aid the diagnosis. The flat scaly form of tinea has to be distinguished from the scaly seborrhoide which is usually associated with dandruff of the scalp Pityriasis rosea and especially the initial "herald spot" may give rise to difficulty The ultimate diagnosis of a doubtful case rests with the finding of the fungus under the microscope.

Chronic eczematoid lesions with a well-defined edge should always be suspected and scrapings of the edge examined for fungus.

Prognosis. The prognosis of ringworm of the glabrous skin, with the exception of the epidermophytoses of the feet, is good. The foot and toe ringworms will be considered later (p. 300).

Treatment. Tinea circinata, ringworm of the glabrous skin, usually responds rapidly to the following treatment. It is useful to distinguish between the dry and the pustular types.

The common dry scaly ringed type is best treated by ointments containing fungicides which can penetrate the skin. Of these the best is Whitfield's ointment, 3 per cent. each of benzoic and salicylic acids in a base containing either soft paraffin and a vegetable oil, or a vegetable oil and lanolin. The new emulsifying bases, lanette wax, sulphonated lauryl alcohol stearyl and cetyl alcohols and sulphonated castor oil make cleaner bases, which are more easily removed by washing and render the contained medicaments more active Ung dithranol is very effective

It should be noted that a small quantity of ointment (not more than a drachm) is required and should be well rubbed in and not merely smeared on the surface

The use of an ointment may however irritate the skin while curing the ringworm. If this happens the area of redness increases with the size of the area treated. Such an extension may be attributed to the fungous

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Prognosis. The prognosis of ringworm of the glabrous skin, with the exception of the epidermophytoses of the feet, is good. The foot and toe ringworm will be considered later (p. 390).

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The use of an ointment may, however, irritate the skin while curing the ringworm. If this happens the area of redness increases with the size of the area treated. Such an extension may be attributed to the fungous

infection with unfortunate results Some patients have an idiosyncrasy to certain remedies notably iodine dithranol chrysarobin and mercury If an acute reaction follows the application should be stopped immediately and the affected part cleansed with a 1 per cent bicarbonate of soda solution and dressed with a bland lotion or paint

It is a wise precaution to have the ointment removed by soap and water once a day and the lesion painted with 2 per cent aqueous gentian violet, triple dye or calamine lotion containing 2 per cent of phenol Penicillin and the sulphonamides have no value as fungicides

Pustular ringworms require different management. It should be



Fig 208 Tinea cruris Epidermophyton inguinale in scrapings of lesions

understood that the pustular reaction tends to destroy the fungus. It may therefore be encouraged by applying hot hypertonic compresses 5 per cent. sodium thiosulphate solution, magnesium or sodium sulphate in glycerine, or bathing with lotio calcii sulphuratæ diluted 1 in 10 in hot water Epilation of the hairs in the affected part and an area around it is of service Whitfield s ointment (3 per cent each of benzoic and salicylic acids) should be rubbed in lightly at night cleaned off in the morning and the hot compress applied followed by a paint of 2 per cent gentian violet in water Instead of Whitfield s ointment resorcin 5 per cent. in a mixture of equal parts of ung sulphuris and ung acidi salicylici may be used Local X ray therapy has been found of service in resistant cases. Three to four doses of 200 r units at 90 k v 3 m.a., 0 5 aluminium filter may be

given at intervals of one to two weeks. Lugol's solution internally (10 drops) in milk two or three times a day has seemed to help very refractory cases

Tinea cruris (Fig 208), is a form of tinea affecting the inner side of the thigh, groin, and gluteal cleft. The disease may spread on to the genitals and down the thighs, and sometimes attacks the axillæ It is due to the epidermophyta: *E. inguinale* *E* *pernetti*, *F* *rubrum* (*Trichophyton purpureum*). In California and Western Canada the *Trichophyton gypseum* is found in a large proportion of cases. The lesions are oval or circular pink or red with a brownish tint, presenting a well marked scaly edge a few millimetres wide and resolving quickly in the centre which may soon resume a normal appearance From the warmth and moisture of the affected parts and irritated by treatment and scratching, the scaly lesions may become eczematous. In the tropics the condition is commonly known as "dhobie itch," because infection was attributed to the dhobie the native washerman who uses his feet in the process of washing clothes, but the custom of lending a change of underwear to guests is also a mode of infection in tropical countries. This form of tinea appears to be highly infectious the infection being probably conveyed through the seats of water-closets, and is eradicated with difficulty when it appears in institutions. *It is often associated with epidermophytosis of the feet.*

Diagnosis. Moniliasis may present a clinical picture similar to that of tinea cruris and the diagnosis will depend upon a microscopical examination of a scraping of the edge of a lesion (p. 806). However the treatment of these two conditions is the same.

Tinea cruris has to be distinguished from erythrasma, which affects the same parts. Erythrasma is more chronic, less scaly and is caused by a different parasite (*vide* p. 407).

Intertrigo of the groins, simple, pyogenic or seborrhoeic, is often mistaken for tinea cruris, but intertrigo is more coloured in the folds and fades towards the edges which is the opposite of what appears in tinea.

Eczematous eruptions may be circinate and sometimes the presence of fungus can only be excluded by using the microscope.

A circinate toxic erythema or an annular drug eruption as is sometimes produced by phenol phthalein may rarely cause difficulty

Treatment of Tinea Cruris. The simplest method is the application of a paste consisting of dithranol gr 2 in one ounce of Lassar's paste, exactly to the affected parts twice daily without washing for three days, followed by a cooling lotion. If dithranol is not tolerated, Whitfield's ointment alternated with paints as *previously described should* be used. Next-to-skin garments should be sterilised to prevent relapses.

The Epidermophyton Infections of the Extremities

Tinea pedis. *The epidermophyton inguinale, E floccosum* is the most common cause of ringworm of the feet and infection is presumably the sequel of picking up infected scales with the bare foot at public baths or in hotels, etc. If the fungus finds conditions favourable for its growth it invades the horny layer and an itching vesicle enlarging to a small blister develops, soon followed by a ring of small satellite vesicles around the edge. Fungus may usually be found in a scraping of the undersurface of the roof

of a blister When a blister ruptures exposing a red denuded surface vesicular erosions extend the edges undermining the thickened cuticle which is often opaque and speckled by the vesicles showing beneath it. This is well shown in the illustration (Fig 209) Tinea pedis usually begins on the ball of the foot near the toe creases or in the centre of the sole where the skin is more vulnerable but the moist toe clefts are soon involved and an acute mycotic intertrigo may follow (Plate 30) The fungus finds very favourable conditions of warmth and moisture and *p*H in the toe clefts especially in the fourth one which is so overhung by the little toe because shoe space is denied it by long established fashion. Consequently the infection often persists in the fourth space and in its quiet phases merely *appears as thickened white skin in the depth of the cleft tending to fissure* or to exfoliate over small vesicles. Many patients believe the macerated



Fig 209 Epidermophytosis of interdigital clefts and soles. Female at 62. Disease believed to have been contracted at a Turkish bath.

cuticle to be the result of not drying effectively after a bath and so the condition is untreated and the individual remains a source of infection to others From the toe clefts infection may be transferred to the hands, groins or axillæ On the hands small vesicles appear on the palm or in the finger cleft and spread as would be expected in a mycotic infection in a circinate pattern (see Fig 207) Thus ringworm infection must be distinguished from a toxic vesicular eruption, called an epidermophytide which is apt to arise in epidermophytosis of the feet as an allergic reaction to epidermophytoxin In this condition the vesicles erupt suddenly and symmetrically on the hands, affecting the palms and sides of the fingers clinically resembling the vesicular eczematous eruption called cheiropompholyx and in both cases the vesicles contain no fungus Naturally a local infection starts with one lesion as a rule and extends peripherally but this may be complicated by a vesicular ide eruption the scattered vesicles of which tend to obscure the pattern of the primary fungus lesions. These

PLATE [illegible]



Ringworm of the toes of ten years' duration, contracted in the tropics.
Acute phase (mycotic intertrigo).

[To face p. [illegible]



allergic vesicular eruptions are essentially eczematous and their frequent association with epidermophyton infections accounts for the term "eczematoid ringworms," chiefly of interest as a historic link with the older name "eczema marginatum" which was wrongly applied to tinea cruris.

Diagnosis. The first difficulty may be that the fungus is not easily demonstrable. If the technique mentioned above is followed there may be no trouble, but secondary infections which are not uncommon, may lead to error. The more common pyogenic intertrigo is often mistaken for tinea.

Pompholyx is likely to cause confusion, but this vesicular eczematous eruption clears up completely between relapses and then suddenly erupts, often on both feet. The relapses in epidermophytosis are extensions from



FIG. 210. Tinea pedis. To show ringworm lesion in 4th interdigital space.

residual infection in the pocket at the bottom of the fourth interdigital space and are often less symmetrical than pompholyx.

Acrodermatitis perstans or pustular psoriasis develops slowly and persists obstinately in spite of treatment, as groups of sterile pustules set in a shiny red patch with exfoliation of its thickened border. Moist (soft) corns and much more rarely condylomatous syphilides in the toe-clefts must be distinguished.

Prognosis. Epidermophytosis of the feet and between the toes may persist for years or there may be apparent cure with relapses. In many of these cases the fungus affects the nails and the disease is not cured there. Relapses are often due to faulty hygiene and the wearing of infected shoes and slippers.

Treatment. In the first place it should be clearly understood that the X rays do not cure this condition. They may improve the eczematoid reaction, if present, but they have no effect on the fungus, which may be embedded in thick horny tissue.

The patient should be warned of the risk of infecting others. Going about barefoot at baths and other public places may spread infection.

It must be remembered that the disease is often contracted at public swimming baths. Turkish baths are also a danger, and persons in the habit of taking Turkish baths are advised to take their own slippers and bring them away with them. Walking about hotel bedrooms, ships cabins, etc., or using bath mats which others have stood upon is risky, especially in the tropics where epidermophytosis is common. Whitfield recommends infected patients to wear slippers with loofah soles and bath towel uppers, which can be sterilised.

After thoroughly cleaning the feet with soap and water the vesicles and pustules should be pricked open, and then warm hypertonic baths of sodium chloride or sodium sulphate coloured with permanganate will relieve irritation. The skin should be dried carefully and exposed to the air for twenty minutes or so before thorough inunction with the ointment. 6 per cent. each of benzoic and salicylic acids in one of the emulsifying bases would be suitable. A thin cotton sock makes a good dressing for the foot, and a pair should be kept for use after applying ointment at night, and another pair for use in the morning when the grease is washed off and a paint applied. If the skin is exfoliated and raw, lotions and the watery solutions of dyes previously advocated should be used, but later on the spirit paints will be tolerated, and by drying and hardening the skin they make the feet more comfortable. In addition to the dyes in 50 per cent. spirit, paints of 3 per cent. benzoic and salicylic acids in industrial methylated spirit or of dithranol 10 per cent. in benzine and paraffin may be more effective in some cases. A balance between ointments and paints should be maintained to keep the skin in a healthy state, using ointments to soften and penetrate thick horny cuticle and to prevent the development of painful fissures between the toes, which happens when the skin becomes dry and brittle. Pastes are tolerated better than ointments and 0·5 per cent. dithranol in Lassar's paste may be applied twice daily for three days without washing, then followed by a lotion or paint. Lotions and paints encourage keratinisation and prevent infection of the new horny layer by keeping it dry and permeated with antiseptic. Dusting powders are helpful too by absorbing perspiration between the toes, and a suitable formula is: 5 per cent. sodium hexametaphosphate with 2 per cent. salicylic acid in equal parts of zinc oxide, boric acid and talc. In relapsing cases 3 per cent. of calomel will make this powder more effective, or one of the several elegant dusting powders specially prepared for the treatment of tinea pedis may be used instead.

After a few weeks of treatment the condition may appear to be cured, but relapse is almost certain if treatment ceases. One of the reactions to mycotic infection is hyperkeratosis, and the very thick horny layer thus produced and the innate resistance of spores make the annihilation of the organism very difficult. Further, in chronic cases the nail fold and the nail beds probably harbour the fungus, and in such sites it

may be impossible to destroy the organism, but its activity can be controlled. Removal of the affected nails and thorough treatment of the nail beds may eradicate the infection. The feet, especially the toe clefts, should be washed daily with carbolic soap and after thoroughly drying them, a paint of 0·1 per cent. perchloride of mercury and 2 per cent. salicylic acid in 80 per cent. industrial methylated spirit should be painted on the soles, between the toes and around the nails. When this has dried, dusting powder should be applied and a little of it shaken into cotton socks, which are preferable because they can be boiled. If woollen or silk socks



FIG. 211 Trichophytic granulomata.

have been worn they need soaking for twenty four hours in dettol or lysol solution before being washed.

It is often forgotten that boots, shoes and slippers are almost certainly infected, and all foot-gear must be disinfected. This may be done by swabbing the insides of the shoes with 20 per cent. dettol solution or by shutting them up in an airtight box or tin for several days exposed to the vapour of commercial formalin. This does not harm leather and residual formalin in the leather continues to exert a fungicidal effect upon the skin, and may prevent hyperidrosis. Excessive sweating is naturally encouraging to mycotic infection, and attempts should be made to check it by the use of hypertonic saline baths, the application of saturated alum solution, or of 2 to 5 per cent. formalin solution, and, in severe cases the cautious application of X rays. It should be remembered that hyperidrosis of the feet may be secondary to the discomfort of a chiropodial or orthopædic condition, to which treatment must be given.

Finally bathroom floors and mats must be cleaned and disinfected, especially in hostels and barracks *All infected contacts must be treated.*

Trichophytic granulomata. In exceptional cases the ringworm and favus fungi may cause a deep inflammatory reaction a true granuloma with epithelioid and giant cells Most of the cases described have been in the Italian clinics, hence the name *Granuloma of Majocchi* E. C. Smith reports that this type of lesion is common on the scalp or foreheads of natives of West Africa. It is often mistaken for a neoplasm and when ulcerated for a syphilide Sequeira had a severe case in a lad in whom there was a large ulcer about the umbilicus (Fig 211) the margins of the ulcer were thick and infiltrated In addition there were numerous flat, button like granulomata on the trunk and extremities and on the left ear The granulomata contained mycelium of a fungus identified by Dr Sabouraud as the *Trichophyton plicatile* The patient had a characteristic scaly eruption on the trunk and limbs and tinea of the nails. The granulomata left deep scars and part of the left ear was destroyed The patient's two sisters suffered from ringworm of the body and one had a few similar granulomatous lesions Other varieties of fungus have caused similar reactions viz., *Trichophyton violaceum gypseum* and *regulare* Injections of the growths with carbolic acid appeared to be the most useful treatment in this case

Large doses of iodide should be tried and ung iod denigrescens rubbed in.

Tinea unguium (Ringworm of the Nails)

Ringworm of the nails is more common than is supposed It may be associated with tinea of other parts or may occur independently Tinea



Fig 212 Onychomycosis due to Trichophyton violaceum. Duration four months (Reproduced by permission of the late Dr E. C Smith.)

unguium is commoner in private practice than in hospital patients We *have reason to believe that in some instances the disease is contracted from* manicure instruments and there is no doubt it is spread from nail to nail by the process of manicure performed by the patient or otherwise The fungi most commonly found are trichophyta of the endothrix type especially *T crateriforme* and *T rosaceum*

To demonstrate fungus in the nail liq potassa " per cent is placed on the nail surface for a few minutes and the macerated patch is scraped with the edge of a glass slide The scrapings are placed on another micro-

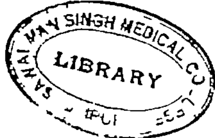


PLATE 40



Mouse-Favus

Achorion Quinckeanum found. Another child in the family simultaneously affected

[To face p. [illegible]]

PLATE 41



TINEA VERSICOLOR

The lesions are scaly patches of *café au lait* tint. Female aged 20.

scope slide a cover-slip is applied, warmed and left for a few hours before examination. Tinea unguium is exceedingly chronic, and usually lasts for many years. One or more of the finger nails may be attacked (Fig 212) and the asymmetrical involvement helps to distinguish the nail lesions from various dystrophies which usually affect the corresponding digits right and left. The toe nails from the protection afforded by the boots and socks are rarely affected by the trichophyta, but epidermophytosis is not uncommon. The nails become discoloured, opaque, and brittle, and under the free margin a scaly mass forms above which the discoloured, brittle nail plate breaks away unevenly leaving a spicular upturned edge. Sometimes the side of the nail is the part first involved. It may be difficult to determine whether the disease of the nails is due to a coccal infection, to ringworm or to monilia, but careful microscopical examination will clear up a doubtful diagnosis. It must be remembered that psoriasis and eczema also affect the nails. In such cases there will usually be evidence of these diseases in other parts.

Treatment. The treatment of tinea unguium is very tedious. The nails should be removed and the matrix painted with 10 per cent. thymol in phenol and dressed with ung iod. denigrescens or 1 per cent. dithranol in Lassar's paste. A conservative but often a futile procedure, is to scrape away the diseased nail plates and to apply to them dressings of Lugol's iodine or Fehling's solution. Some benefit may result from fractional doses of X rays (200–300 r) which are not fungicidal. In resistant cases the total excision of the infected matrix offers the only chance of cure.

Favus of the Glabrous Skin

(Lat., *Glaber* smooth)

Favus rarely attacks the non hairy parts of the body. The peculiar lesions are circular yellow cups (scutulæ) varying in size from a millet seed to a sixpenny piece (Plate 40). There is some little inflammatory thickening around in some instances. On removal of the cup a superficial ulcer is found. The cups examined in liquor potassæ under the microscope show characteristic branching fungus with spores. The scalp may be quite free from disease. In very rare instances the infection of the trunk and limbs is extensive. Sometimes the clinical appearances are those of the common ringworms and the diagnosis is made in the laboratory and confirmed by cultures. Most of these cases of favus of the glabrous skin are not due to the achorion schonleinii, but to the mouse achorion, *A quinckeanum*. Plate 40 depicts a case of this kind.

Mouse favus may be epidemic in ports from infested wheat cargoes.

Provided the condition is borne in mind, there is no difficulty in recognising the affection. The yellow character of the cup suggests, and microscopical examination confirms the diagnosis. Treatment with the usual fungicide is effective after removal of the thick crusts.

Tinea versicolor (Pityriasis versicolor)

(Gk., *pityron* bran)

This disease is caused by the *Microsporon furfur* (Lat., *furfur* bran) (Fig. 213). The fungus is found in the horny layer of the epidermis. It

consists of an abundant mycelium of interlacing jointed threads. The spores are arranged in masses or clumps The parasite is easily demonstrated under the microscope in scrapings of the skin examined in liquor potassæ.

The *lesions* are fawn-coloured, pale pink or café au lait tinted, well defined patches At the onset they are no larger than a pin's head, but they spread peripherally and by coalescence large areas may be covered The *fine branny scales can be removed by scraping showing the disease* to be on the surface The chest and back and sub-axillary areas are the parts usually affected, but the upper extremities may be involved It is exceedingly rare on the face. There is often some itching when the skin is warm McEwen has described a case in which there were papular lesions

The patients usually perspire freely and are averse from the free use of soap and water Enquiry will often elicit the fact that the patient sleeps

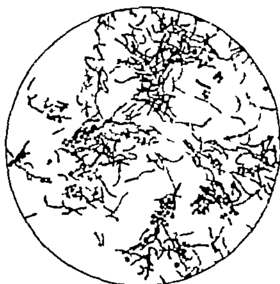


FIG 213 Microsporon furfur ⅙ obj

in the vest worn by day or is addicted to woollen underwear and because *silk and wool cannot be boiled in the laundry the organism* persists in the fabric and accounts for the reinfection. Warm weather favours the development of the disease. Consumptives who sweat a great deal are said to be frequently affected (see Plate 41)

The disease is easily cured but relapses are common.

Pityriasis versicolor achromiant (Achromia parasitaria) is a rare sequel of this variety of fungus infection of the skin. White patches or spots *follow the disappearance of the scaly* eruption and are uninfluenced by treatment but ultimately may disappear

The **diagnosis** is confirmed by the microscope

The affection has to be distinguished from pigmentary anomalies

Leucodermia is characterised by white patches of skin with areas of excess of pigmentation surrounding them There is no scaling and the patches cannot be removed by scraping Arsenical pigmentation of the *trunk is of a* dappled character and here again scaling is absent except in

a few acute cases. Syphilitic pigmentation is usually seen on the neck. In Addison's disease the pigmentation is of a bronze colour and is most marked where pigment is normally well developed. The mucous membranes are also affected.

Treatment. Frequent changes and disinfection of the underclothing should be enjoined, and especially the removal of the day garments on going to bed. Cotton undervests should be worn and boiled in the wash. The affected areas should be washed with soft soap and warm water and the following lotion freely applied —

> ℞ Phenol liq., 2
> Tr iod. mitis, 25
> Aq camph., ad 100

Some apply sulphur or Whitfield's ointment and lotions of the hyposulphites; or perchloride of mercury 1 in 1 000 in 25 per cent. spirit.

Recurrences may be obviated by the use of a sulphur or mercurial soap.

REFERENCES—V PARDO-CASTELLO and M. M. DOMINGUEZ. "Pityriasis versicolor achromiant. *Archiv Derm. and Syph.* (Chicago), 1934, 9, 82.
H. GOUGEROT *et al.* *Bull. Soc. franç. de Derm. et de Syph.*, 1931 38, 1297

Erythrasma

(Gk., *erythraino* redden)

A parasitic disease producing reddish-brown patches in the genito-crural and axillary flexures and the gluteal cleft.

Etiology The affection is a trivial one, and is often overlooked. It is, therefore, difficult to estimate its frequency. Men are more commonly affected than women. The disease does not appear to be contagious in a marked degree for we have known instances of its persistence for years without being conveyed from husband to wife. Warmth and moisture are necessary for its development.

Pathology The lesions are caused by the *Microsporon minutissimum* (*Nocardia minutissima*), a fungus consisting of extremely fine, interlacing jointed threads without branches. A few spores may be present. The fungus lies in the epidermal scales. Cultures are obtained with difficulty.

Clinical features. The eruption consists of well-defined brownish or brownish-red macular patches with a small amount of branny scale. It is confined to areas which are warm and moist, *e.g.*, the genito-crural flexures groins, gluteal cleft and axillae. In rare cases the patches extend on to the limbs. The disease is exceedingly chronic but spreads very slowly. Relapses after apparent cure are common.

Diagnosis. Tinea versicolor is distinguished from erythrasma by the presence of lesions on the trunk. Tinea cruris is more inflammatory and its evolution is more rapid. The microscope would settle any difficulty in diagnosis, but an oil immersion lens may be required to reveal the fungus of erythrasma and we have never seen it in film or in culture. Probably many anomalous pigmentations of this area are wrongly diagnosed as erythrasma.

Treatment. The treatment is the same as that of tinea versicolor



FIG 214 Erythrasma.

Tropical Ringworms

Tinea flava (tropical pityriasis versicolor) is very common in the tropics. The fungus is the *Malassezia tropica* Clinically the disease takes several forms The commonest eruption is of macules or patches of fawn or pale yellowish brown colour The face the neck, chest and arms are the usual sites By coalescence the spots produce irregular map-like areas. In many instances innumerable light coloured discrete lesions round the hair follicles produce a mosaic like appearance (E. C Smith) In the European the lesions have a pinkish tinge The eruption is very persistent. It may have to be distinguished from macular leprosy from common ringworm and from vitiligo The diagnosis is made by finding the *Malassezia tropica* (Castellani 1905) in the scales The parasites lie in the horny layer and are most prolific round the hair follicles where they penetrate more deeply Smith recommends the following lotion Acid salicylic. grs 20 hydrarg perchlor grs 2 spirit vini rect 2 ounces, aq destil ad 6 ounces

Tinea nigra is another tropical affection The patches are dull black.

Xanthoderma areatum. A yellowish or reddish yellow pigmentation occurring in patches on the lower part of the legs The onset is insidious

and the spots coalesce to form large irregularly outlined areas without infiltration. The affection occurs in the tropics and runs a chronic course



Fig. 215. Tinea flava. Diffuse type. (Reproduced by permission of the late Dr H. C. Smith.)



Fig. 216. Tinea flava. Scrapings stained by Gram. Clusters of spores and short mycelial fragments. × 800. (Reproduced by permission of the late Dr H. C. Smith.)

without symptoms. Its cause is unknown. The local application of resorcin and salicylic acid is recommended.

Tinea alba is a chronic diffuse powdery squamous eruption on the limbs and trunk caused by a tropical fungus, the *Epidermophyton rubrum* (*Trichophyton purpureum*)

Tinea albigena occurs in the Far East It affects the palms and soles chiefly The eruption may become bullous Ultimately hyperkeratosis occurs It may last for years and is caused by a trichophyton.

Tinea tropicalis was first described by Sabouraud as occurring in patients returning to Europe from the Far East. The legs are affected first The eruption is erythemato squamous in small spots which become ringed or polycyclic. There is much itching The fungus is the *Trichophyton blanchardi*

Tinea imbricata (Tokelau ringworm) (Lat *imbricare* to form like a tile). This ringworm is met with in the tropics The fungus *Endodermophyton concentricum* (Gk *endo* in *derma* skin *phuton* plant) or *E indicum* is found in abundance in the epidermic scales, but the hair follicles usually

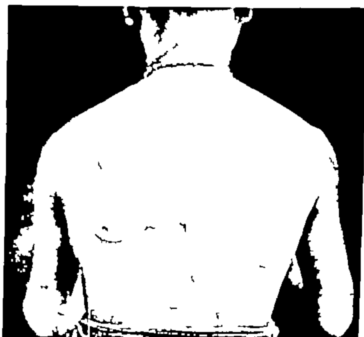


Fig 217 Tinea imbricata. (Photograph lent by Dr C W Daniels)

escape The mycelial threads are long and the spores are irregular in shape

Both sexes are equally susceptible but children are more affected than adults The disease is highly contagious.

The fungus may attack any part of the trunk and limbs, but avoid the scalp and other hairy parts

The lesions consist of patches or concentric scaly rings They spread peripherally and produce an appearance like watered silk (Fig 217). The scales are thin flakes like tissue paper which are firmly attached towards the margin of the ring and free towards the centre The concentric rings and systems of rings are well shown in the photograph for which we are indebted to Dr C W Daniels The separation of the scales leaves concentric rings of fawn colour There is no interference with the general health, and the only symptom is itching

Manson advised destruction of the clothes, sulphur baths, and the application of strong iodine solutions. The rubbing in of a 5 per cent. chrysarobin ointment is often successful. We have found the application of resorcin, 2 drachms in an ounce of tr. benzoin co. rapidly effective in some cases. Painting with 40 per cent. formalin or with Castellani's fuchsin paint is also useful but it is estimated that half the patients are not cured. In obstinate cases, bi-weekly injections of iodine 1 part potassium iodide 2 parts in distilled water 800 parts beginning with 2 c.c. and increasing gradually to 7 to 10 c.c., have given good results.

Tinea intersecta occurs in Ceylon and Southern India. It is caused by the *Endodermophyton Castellani*. The eruption consists of dark brown elevated patches, which shrivel and crack.

Ulcerative dermato-mycosis (Gk. *mukes* mushroom). **Acladiosis.** This



FIG. 218. Tinea imbricata. Fungus in scrapings.

condition was first recognised by Castellani and a good description was given by him and Jacono in 1934. The disease occurs in Malaya, South America, Siam and Ceylon. In a typical case there are multiple sharply defined round or oval ulcers varying in size from a sixpence to a half-crown. They may be easily mistaken for late syphilides. The ulcer secretes an abundant purulent fluid which dries up to form thick yellowish rupia like crusts. On the removal of the crusts the base of the ulcer is seen to be studded with rather prominent red granulations. Occasionally gumma like swellings may also occur. The ulcerations may appear anywhere, but are least common on the head and the palms and soles. The disease runs a chronic course and may be attended with mild pyrexia. In the later stages there is a secondary anaemia.

The causative fungus is the *Acladium castellani*.

Iodide of potassium in twenty grain doses thrice daily and the local application of mild antiseptics are recommended.

REFERENCE.—CASTELLANI and JACONO. *Jour. Trop. Med. and Hyg.*, 1934, 37, 360. Plates.

Ringworm of the Hairy Skin

Ringworm of the scalp (Tinea tonsurans) (Lat *tondere tons* shave). Ringworm of the scalp may be caused by the microsporon by the endothrix trichophyta and by the ecto-endothrix trichophyta Infection takes place by direct contact, and also by combs, brushes and the interchange of caps and hats In one group of cases infection was apparently caused by the hairdresser s clippers. Infection from pet animals is not uncommon

The cause of scalp ringworm in children is predominantly microsporon and in London 10 per cent. or less of the cases are due to trichophyta but on the Continent the proportion of the latter is higher and varies con



Fig 210 Tinea ton urans Microsporon Andouinil.

siderably in different localities Microsporon infection of a hair produces a substance which fluoresces under long wave ultra violet light and thus a solitary infected hair may readily be recognised by its bright green "butterfly wing fluorescence The method is invaluable in diagnosis and in the checking of treated patients but it must be emphasised that only microsporon infections give unmistakable fluorescence Wood s light as it is popularly termed is best obtained by screening a bright source of light such as a mercury vapour or an arc lamp with a special cobalt and nickel glass filter which only transmits deep purple and the long wave ultra violet The examination must be made in relative darkness.

The clinical features of scalp ringworm vary with the parasite

Microsporon cases This disease is especially one of childhood. Most of the cases occur in children between five and fifteen years It i exceedingly rare after puberty but Oliver reported two mot

from their children and we have seen a few adult cases since. On the other hand, we have seen several instances in infants at the breast. The disease is contracted by direct contact, by infected caps, hair brushes, and the like. Though commonest in the children attending the elementary schools, no class is exempt. Outbreaks in large boarding schools are far from uncommon.

In its earliest stage ringworm of the scalp appears as a small scaly spot, perhaps not larger than a threepenny piece, with a few broken hairs



Fig. 220. Microsporon Lanosum. Note the ringed arrangement of the scalp lesions.

present on the patch. It is, of course, often overlooked owing to the hair. In the more advanced cases the areas infected may be numerous and of varying size. Older patches are covered with ashen grey scales (Fig. 219), which may be thicker and more elevated at the margins thus presenting a circinate pattern, but this feature of ringworm is rarely conspicuous and the special character is the number of broken hairs scattered over the patch, like stubble. Sometimes there are many small collections of scales around the hair follicles only. In the cases of long duration the whole scalp may be covered with scales, and a diagnosis of dandruff or scurf is often made, but examination under Wood's light may reveal a very extensive infection.

Again notice must be taken of the broken hairs scattered all over the patch. These hairs are about one-tenth to one-eighth of an inch in length. They are easily removed by the forceps, several stumps often being lifted up on detaching a scale and on inspection are found to be without lustre and surrounded by a white sheath. Microscopic examination of this sheath, the hair being mounted in liquor potassae reveals a mass of small round *spores closely set to form a kind of mosaic* The fractured ends of the hairs are irregular resembling frayed rotten rope In the scalp lesions of young children and also in others in whom the hair is short, a ringed arrangement of the scaly lesions is sometimes observed In the micro sporon ringworms of animal origin ringed lesions are the rule (Fig 220)

On the neighbouring parts of the glabrous skin discs or ringed patches often co-exist with microsporon infection of the scalp The ringed character is again more marked in the infections of animal origin (*vide Ringworm of the Glabrous Skin, p 395) Scaly macules follicular* papules and eczematous lesions may also arise as allergic reactions of the glabrous skin on the trunk and limbs Further reference is made to these microsporides on p 422

If left alone or inefficiently treated the disease may last indefinitely certainly for two or more years but microsporon infections usually clear up at puberty It has no effect on the general health, and there are usually no subjective symptoms though itching is sometimes complained of *More serious is its interference with the education of the patient,* as quarantine must be enforced until the disease is eradicated.

Kerion Occasionally the lesion produced by the *Microsporon audouini* is inflammatory a condition known as kerion (derived from the Greek for a honeycomb) because the surface is studded with yellow purulent follicles One or more patches become red swollen, and boggy resembling a developing carbuncle but flaccid and painless The dome shaped swelling does not contain pus and on incision only a serous fluid exudes but many purulent follicles may be present from which broken hairs may project, and some of these are found to contain fungus.

Endothrix cases. This variety also occurs in childhood but it may persist beyond puberty

The lesions differ from those of the microsporon. They are not scaly but the hairs are brittle and sometimes break off flush with the scalp producing an appearance which has been described as *black-dot ring* worm (Fig 221) In other instances the hairs may be half-an inch long or even longer The affected hairs do not fluoresce under Wood's *light* Sometimes the areas are bald, so-called " bald ringworm and the broken hairs are only found at the margins. The disease is exceedingly chronic and even more persistent than that due to the small-spored fungus It appears, however to die out spontaneously after the lapse of years but may continue to adult life

The *hairs have a normal cuticle* but the interior of the shaft contains spores in chains and rod like mycelium (Fig 200)

Ecto-endothrix cases The parasite in these cases is derived from some animal cattle and horses commonly *either directly or indirectly* The lesions are apt to be more inflammatory than those of the preceding classes The areas are round and scaly or of the *kerion* type just described

The course of this form of scalp ringworm is much shorter than that of the other varieties.

Diagnosis. The diagnosis of scalp ringworm may be attended with little difficulty but it is often missed, especially in the endothrix cases. The following points should be borne in mind. Localised scaliness of the scalp in a child is more likely to be due to ringworm than to anything else and the microscope should be at once used to examine any broken hairs.



FIG. 221 "Black-dot" ringworm of the scalp. Endothrix fungus.

The microsporon infection may be recognised with ease by Wood's light examination which should be a routine measure. Hairs infected with favus may also fluoresce and somewhat imitate the microsporon infection and cultures may be necessary to establish the diagnosis. The endothrix cases are more difficult. If the patch is bald, alopecia areata may be suspected, but the clean smooth surface and "note of exclamation mark" hairs are characteristic. The examination of hairs from the margin should be made in any doubtful case. Black follicular plugs on a bald area should at once raise the suspicion of endothrix ringworm, and the hair stumps should be expressed, and then examined under the microscope.

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0·1 to 0·5 per cent. The reactions to treatment should be closely observed and the effect upon the infection noted under the Wood's light. A pustular folliculitis may be provoked by the stronger fungicides but usually responds to saline compresses and an aniline dye paint, and accelerates recovery. K. Crow (1946) has obtained cures by these methods.

With X-ray or thallium acetate epilation milder measures are employed as a routine and these are described below.

Kerion, the localised pustular variety of scalp ringworm, is treated as for pustular ringworm of the beard area, p. 421. Hot fomentations of 1/1000 perchloride of mercury are useful, but X-ray epilation is not advised since the purulent reaction assists cure and may itself produce epilation, sometimes destroying the follicle and resulting in permanent alopecia.

X-ray treatment. By far the most useful method of treatment is the ancillary epilation by the X-rays. It must be understood that they have no parasiticidal action but are simply used to remove the hair after which intensive therapy must be applied to the bald scalp in order to eradicate the fungus before the hair regrows. The established method of procedure is Adamson's modification of Kienbock's system in which the scalp is irradiated in five planes, but Molesworth's method of irradiating four areas is satisfactory and safer. The apparatus recommended is a shockproof tube fitted with a tripod set for an 8-inch target-skin distance or adjusted to give a field of irradiation of $5\frac{1}{2}$ inches in diameter. If the innate filtration of the tube is less than the equivalent of 0·5 mm. aluminium, an extra filter of this value may usefully be added. A kilovoltage of 90–100 is recommended and with a tube current of 8 m.a., a dose of 400 *r* can be given in four to six minutes. A dose of 400 *r* may be taken as a safe epilation dose although Cochrane Shanks (1938) found that the areas of triple overlap received 669 *r* with the five area method of epilation and 571 *r* with the four area method. Since the margin of safety is small, an accurate method of measuring X-ray dosage is essential and the use of pastilles is no longer advised. As a rule it is necessary to treat the whole of the scalp, and to effect this the hair is cut short all over. Five points are then taken and carefully marked with blue pencil. The first point is marked $1\frac{1}{2}$ to 2 inches behind the centre of the margin of the hairy scalp in front. The second point is taken immediately above the lower edge of the scalp in the middle of the occipital region. The third point is in the middle line of the scalp exactly midway between the two points already marked. The remaining two marks are symmetrically placed on each side, just above and a little in front of the top of the ear. Each point should be exactly 5 inches from its neighbours. The patient is now placed so that one of the points marked is exactly in the middle of the three pegs attached to the tube holder and the rays received at this point are perpendicular to the surface. A dose of 400 *r* is then given. The process is repeated for each of the five points. Radiation administered in this way covers a greater area than is actually required, and the parts below the scalp margin on each side of the head and the frontal and occipital regions must be screened with rubber impregnated with lead. The exact adjustment of the applicator to the spots named ensures that the whole of the scalp will be epilated. The central parts of each area get the full dose of rays, while the margins are overlapped and receive a dose from two or three adjacent exposures.

Finally hairs broken off short should always be examined for tinea. Kerion may be mistaken for a form of pustular infection if the condition is not kept in mind

Prognosis depends on the thoroughness of the treatment.

Treatment. It is emphasised that the temporary removal of all the scalp hair by X rays or thallium acetate is still the most time saving factor in treatment by removing the bulk of the infection and facilitating the



Fig 222. Showing the complete epilation produced by X-rays and illustrating the method of application to the mid vertex point using the five-point technique

entry of the applications into the follicles Without epilation treatment by fungicides alone rarely effects a cure of tinea tonsurans in a reasonable time but one may have to depend upon it if for some reason epilation is not performed In this event the most potent fungicides are indicated and they should be dissolved in penetrating solvents such as alcohol acetone benzine, carbon tetra-chloride etc. or suspended in penetrating bases such as goose grease and the emulsifying bases The fungicides usually employed are iodine thymol salicylic and benzoic acids, 5 to 10 per cent dithranol 1 to 2 per cent or chrysarobin 5 per cent mercury oleate 5 to 10 per cent mercury perchloride and ethyl mercuric nitrate

endeavoured unsuccessfully to put it to practical use, but it was not until the last war that Buschke by animal experiment established the dosage required to effect epilation without causing serious harm to the subject. The toxic effects of thallium are similar to those of lead and include malaise, sickness, diarrhoea, nephritis, extreme pain in the legs and feet, hypotonia, loss of weight, anaemia and encephalitis.

There are obvious dangers associated with the use of thallium for ringworm of the scalp, but there are obvious dangers with the use of many drugs regularly employed in medicine. Actually this line of treatment is most valuable and is apparently quite harmless if properly applied in suitable cases.

The method should be used only in young children who are physically fit and in whom examination, including examination of urine, is satisfactory. X-rays are preferable in the majority of cases from the age of five years upwards and below that age thallium may be employed. Using an immobilising board with many restraining bands Cochrane Shanks successfully treats children from one year of age with X-rays.

The dosage necessary to produce epilation and yet not likely to cause harm is readily ascertained. The child is weighed naked; four times the weight in pounds gives the necessary dosage of thallium acetate in milligrammes, *e.g.*, a child weighing 30 lbs. naked will require 120 mgms. of thallium acetate *i.e.* 8·5 mg per kilogramme of body weight.

It is wise never to give to an out patient a dose of thallium acetate greater than 150 mgms. and it is not likely that a child of the age of five will require more than this dosage. The drug should not be used if the calculated dose exceeds 250 mg.

The drug must be given *in a single dose* at one and the same time. It is preferably given as a powder washed down with a sweetened drink. *The administration of thallium should never be repeated.*

A disadvantage of this treatment is that the hair does not fall so effectively as with X ray epilation, it is merely loosened in fourteen to twenty-one days by that time the new hair is already growing, whereas with X ray treatment the scalp remains bald for six or eight weeks. The risk of reinfection of the new hair is therefore considerable.

To remove the infected hairs as quickly as possible it is wise to paint the whole scalp with tr. iod. mitis. three times a day from the time the thallium is administered, refraining from washing the scalp during this period. The iodine should be kept to the hairy scalp and not painted on the smooth skin beyond or it will cause irritation. The effect of this is to produce a coarse iodine desquamation of the skin of the whole scalp and this desquamation will bring out the infected stumps. Three weeks from the time of the administration of the thallium the scalp is washed for the first time the iodine treatment is continued and the scalp is subsequently washed twice a week until negative to Wood's glass inspection. If the tincture of iodine is too irritating it may be replaced by or alternated with ung. iod. denigrescens or iodex. Ung. dithranol is a valuable remedy.

Favus of the Scalp

Favus is a common disease in Eastern Europe but its distribution in other areas is somewhat capricious. We have been informed by officers

Molesworth's four area technique may be planned thus according to Cochrane Shanks A 5½ inch length of tape is laid along the sagittal suture leaving approximately equal margins of scalp fore and aft, but the frontal margin should not exceed 3 inches and if the occipital margin then measures 4 inches or more an extra dose of 30-50 r may be given centred over the latter A 5 inch length of tape is used to fix a point above each ear equidistant from the two points in the mid line this point is slightly higher than the corresponding one in the Kienböck Adamson technique

If the proper dose has been given the hair begins to fall out on the fifteenth day and epilation is usually complete in about a week though the hair may continue to fall for two to six weeks if a rather less dose has been given. The new hair begins to grow a month to six weeks later and it is curious to note that it is sometimes curly If the ringworm appears to be limited to a small area the procedure should not be modified as it is almost certain other *parts of the scalp are infected. This is* frequently revealed by Wood's glass inspection. Epilation should be completed manually aided by forceps or strips of adhesive plaster which should be *burnt with the adhering hairs. The falling hairs are laden with spores* and the patient may infect himself or others During the defluvium the scalp is frequently washed and strong fungicidal preparations such as *Whitfield's ointment ung dithranol ung hydrarg ammon or ung iod* denigrescens must be applied daily Bi weekly painting with tr iod. is helpful and a local persistence of infected stumps often revealed only by Wood's light, should be cauterised with a paint of phenol liq 50 per cent in tr iod fort. Occasionally a pityriasic eruption occurs two or three weeks after X ray treatment. It is believed to be an "ide" reaction (*vide* p 422)

The treatment is most effectual and when carefully carried out is free from risk. For some years past over 800 cases per annum were treated at the London Hospital with most satisfactory results. *There is no* foundation for the suggestion that the brain is likely to be injured. This has been proved experimentally and also by a now lengthy experience X ray epilation has been performed successfully on children and *infants of* even one year of age the young children being controlled during treatment by an appliance or by a narcotic such as paraldehyde per rectum or seconal per os. Parents or guardians of the child should understand exactly what is going to be done and the written consent of the parent should be obtained but with the modern methods of measuring X ray output such accidents as permanent baldness after the use of *the* X rays should not occur An insufficient dose followed by incomplete epilation is annoying on account of the delay for a second application of the rays should not be made until at least *six months* have elapsed from *the first* treatment.

The treatment of favus of the scalp and of ringworm of the beard region is carried out on the same lines as that of tinea capitis

An alternative method of epilation is used and sometimes preferred for children under six years of age This is epilation by thallium acetate

Epilation by thallium acetate. It has long been known that one *of the* toxic effects of thallium is falling of hair The drug was used in the latter part of the last century to control the sweating of phthisis Sabouraud

termed scutula, about a tenth to an eighth of an inch in diameter closely resembling those in Plate 40 but smaller (see also Fig 223) They consist of masses of fungus, epidermal cells, dried sebum and debris. The cups are rather difficult to remove and in chronic cases their removal discloses small bleeding cavities, showing that the true skin is involved The involvement of the dermis leads to a characteristic patchy cicatricial atrophy The scalp affected with favus has a peculiar mouse-like odour The disease is exceedingly chronic, and may persist to adult life. Darier and Hallé report a case of favus in which a granulomatous nodule developed in the corium.

We have seen scalp favus clinically indistinguishable from the small spored ringworm and the pathologist corrected the diagnosis. No lesions at all resembling scutula were present in these cases, but the incidence is very rare. The hairs usually fluoresce under Wood's glass and U V.L.

Epilation with the X rays is required, and this must be followed by vigorous treatment with fungicides. Owing to the depth to which the fungus penetrates, favus is much more difficult to eradicate than the ringworms.

Tinea barbae. Pustular Ringworm of the Beard

Tinea barbae is a folliculitis of the hairy regions of the face caused by the endothrix and ectothrix trichophyta

Etiology This form of ringworm is generally contracted by farmers and labourers in contact with infected animals, but infection may be acquired at the barber's, the fungus being introduced by the shaving



Fig 224. Tinea barbae (calf ringworm).

in the Indian Medical Service that they have frequently to reject men on the North West Frontier offering themselves for military service on account of the disease. In other parts of India favus appears to be rare It is met with in many other parts of Asia In Africa it is uncommon on the West Coast It is also rare in East and Central Africa but is common in the Anglo-Egyptian Sudan and in North Africa. It is also reported as



Fig 223 Favus of scalp showing numerous small cups in which the Achorion Schönleinii was abundant

occurring in the natives of South Africa. It is rare in England except in the children of immigrants from Eastern Europe Many cases have been seen in Ireland and parts of Scotland where mouse favus is common

The Achoria (Gk *achor* dandruff) attack the scalp the glabrous skin (*vide* p 403) and the nails and exceptionally the mucous membranes. Sequeira had under his care for some time a boy whose tongue was involved

The fungus invades the hair and the true skin and produces inflammatory changes in the latter leading to cicatricial atrophy

The characteristic lesions of scalp favus are small sulphur yellow cups

reactions, may cause general as well as local phenomena. The injection of extracts made from certain fungi, acting like tuberculin, produces (1) a local reaction at the site of injection, (2) a reaction in the actual ringworm lesion, and (3) a general reaction with pyrexia. It is rare to find these phenomena in the superficial form of tinea. Guinea pigs and rabbits can be infected with certain forms of fungus, and when the reaction has healed the animals present on re-infection a modified reaction similar to Koch's phenomenon in tuberculosis.

In the human subject the blood in the kerion and other deep types of

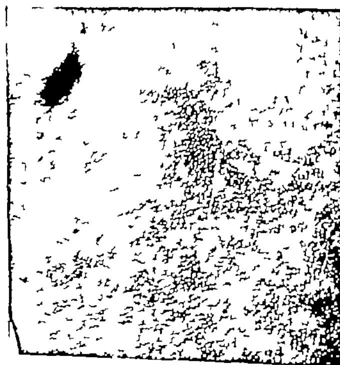


FIG. 223 Papular trichophytide (Lichen trichophyticus). (Kindly lent by Prof. C. Rasch, Copenhagen.)

ringworm shows increase in the polymorphonuclear cells, and the same change has been seen to follow injection of fungus extracts. Complement fixation bodies are found in the serum, but they are not specific to any one particular fungus.

Cutaneous and intra-cutaneous injection of trichophyton extracts give positive reactions, in patients who have suffered from deep types of ringworm for years after the infection has cleared.

Attempts have been made to cure ringworm by injection of these extracts, and, occasionally intradermic injections of trichophyton vaccine have been successful. Ointments made from extracts of fungi have also been used with some success in deep seated varieties of tinea. The

brush and (possibly) by the razor An interesting case was that of a barber's assistant who lathered the customers and attended the London Hospital clinic with ectothrix ringworm on the hand

Pathology The lesions may closely resemble a coccogenic sycosis, the follicles being converted into small abscess cavities. W J Oliver found the *Trichophyton violaceum* the commonest fungus in beard ringworm The *Trichophyton rosaceum* came next in frequency *T faviforme* and *T plicatile* were found, and also *Microsporon felineum* An avian fungus with pink cultures and an equine variety have been described.

Clinical features. The primary lesion is a round red itching spot which may be covered with scales In some forms a scaly ring develops in others the margin of the ring is papular or papulo pustular and sometimes vesicular There are often scattered pustules about the hairs at some distance from the primary patch or ring In a few cases the lesions are red, raised boggy swellings like kerion of the scalp (Fig 224). These swellings may easily be mistaken for septic granulomata. They consist of numerous follicular and perifollicular abscesses from which loose hairs project. The hairs are easily removed, and the fungus is demonstrated in non suppurating lesions without difficulty The endothrix infection like "black-dot" ringworm of scalp gives bald areas with hairs broken off at the skin surface The ectothrix variety causes the scaling papular and pustular forms The disease may last an indefinite time sometimes for years Cicatrices may be left Tinea may be present upon the glabrous skin in other parts and such lesions may be primary or secondary Ringworm of the moustache is rare

Diagnosis. The diagnosis is made by examining the hair in liquor potassæ under the microscope This should be done in every suspicious case of folliculitis of the beard region

Treatment. Hot compresses of 2 per cent. sodium thiosulphate are helpful in the pustular variety Iodex or ung iod denigrescens or 0 5 per cent. of dithranol in Lassar's paste are valuable fungicides The following paints are in an ascending order of potency 2 per cent. gentian violet in water or in 50 per cent. spirit malachite green paint and Castellani's fuchsin paint. X ray epilation is not advised, but doses of 150 r may be given at weekly intervals for four weeks

Tinea ciliorum. Tinea of the eyelashes is exceedingly rare Montgomery and Walzer described a case of *Microsporon audouini* infection in a boy aged eleven It was recognised by ultra violet fluorescence (1942) *Arch Derm. Syph* (Chicago) **46** 40 (Photograph and photomicrograph)

Tinea of the pubic hair is very rare also

General Reactions to Ringworm Fungi Trichophytides Microsporides and Favides

We owe to Jadassohn a new conception of the effects of fungus infection He was the first to call attention to the appearance of a follicular eruption which may follow deep ringworm infections. His early cases were in children suffering from kerion The subject has been widely investigated and it is now recognised that ringworms especially those producing deep

alone in the yellow variety and in symbiosis with *Micrococcus nigrescens*, which produces a black pigment in the black type and with a coccus producing a red pigment in the red variety

Clinical features The affected hairs present yellow black or red nodular excrescences. They are easily removed by scraping The hairs are not brittle The affection is chronic but usually disappears when the patient returns to a cold climate

Treatment. The application of formalin ten minims to an ounce of spirit and a weak sulphur ointment are sufficient to remove the disease.

REFERENCE—CASTELLANI. *Brit. Journ. of Derm.*, 1911, 341.

Myringomycosis (Lat *myringa*, drum membrane Gk., *mukes* fungus). A scaly dirty grey or brownish, usually moist coating lining the external auditory meatus The surface is often dotted with round yellowish, green or blackish spots, and there is frequently serous exudation. The eruption may extend to the membrana tympani.

On removing the scale a moist bleeding surface is found. Itching is complained of

There is no tendency to spontaneous cure It is reported to be caused by the *Aspergillus niger* and *glaucus* in most cases. In others it is believed to be due to a saccharomyces.

Treatment. An alkaline lotion to remove scale, followed by a spirit antiseptic lotion, is recommended.

REFERENCE—BURNETT "System of Diseases of Ear Nose and Throat, Vol. I., p. 190.

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Yeast Infections of the Skin

The organisms termed monilias belong to the fungi imperfecti and multiply by spores or conidia with budding forms, mainly seen in cultures. Long and septate hyphae are seen amongst the numerous oval or rounded spores, the presence of which helps to distinguish the organism from ring worm. Undoubtedly many of the species of monilia are saprophytes, and their presence in a lesion of the skin and especially in a lesion of a mucous membrane is no indication of a pathological *rôle* Yet the pathogenicity of at least two species, monilia albicans and m. pinoyi has been established by experimental and clinical observations and many instances of monilia infection of the mucous membranes, skin folds and nails have been reported.

Mucous membrane lesions The characteristic white felt like patches of thrush, which are relatively common on the buccal mucosa of bottle fed babies are due to infection with monilia albicans which *is readily demon*

reaction is not specific, for extracts of achorion quinckeanum are reported as giving good results in trichophytic infections.

The commonest type of eruption recognised is the papular trichophytide (lichen trichophyticus). The lesions are minute red, follicular papules mainly on the trunk. Sometimes the papule is capped with horn and closely resembles lichen spinulosis. In rare instances the lesions are grouped like the corymbose syphilide. Histologically a papule is found to consist of a small round-celled infiltration about the follicles and peri-follicular tissue. The epidermis shows parakeratosis.

Vesicular and pustular lesions are less common in these varieties of mycotic infection, *but pompholyx is frequently seen as an epidermophytide.* In a few instances there is a spongy œdema producing an eczematoid reaction. In still rarer cases the eruption suggests a circulatory toxin, the lesions being a punctate (scarlatiniform) erythema or of the erythema multiforme type. Nodular subcutaneous lesions simulating erythema nodosum have also been described. From one such in which spore elements were found pure cultures of trichophyton gypseum were obtained, the original infection in this case being of the beard.

There seems to be no doubt from cultural experiments that in some cases there is a blood infection; in others the reaction is due to skin infection in a subject rendered hypersensitive or allergic and this is the true "-ide" eruption. *To the latter is ascribed a reaction met with after X-ray* treatment (p. 418).

REFERENCES.—R. SABOURAUD. "Les Teignes." Many figures and plates. X-ray Treatment. E. H. MOLESWORTH and A. R. RIDDLE. *Brit. Journ. Derm.* 1935, 47, 152. H. L. BROWN. *Ibid.*, 1938, 50, 434. COCHRANE SHANKS. 1935, 50, 440. A. WHITFIELD. *Journ. Trop. Med. Hyg.*, 1934, 37, 353. N. GOHAR. "First Survey of Ringworm in Egypt." *Journ. Trop. Med. Hyg.*, 1938, 41, 229.

Piedra. Trichosporosis. A parasitic affection of the beard, moustache and scalp characterised by irregularly placed dark nodules on the hairs.

Etiology. The disease occurs in the Balkans and rarely in other parts of Europe, but we have seen a case in this country. It is however most common in the natives of the tropics (Central Africa, Asia, S. America).

Pathology. Both in the exotic and in the rare European cases fungi have been found, the swellings on the hairs consisting of masses of rather large spores. *Trichosporum beigeli.*

Clinical features. The nodules are remarkably hard, of a black or dark brownish colour, rounded or fusiform in shape, but sometimes placed on one side of the hair only. They are removed with great difficulty and do not tend to fracture of the hairs.

Treatment. Shaving or cutting the hair close to the root is the best remedy, but antiseptics such as 1/2,000 perchloride of mercury in an ethereal solution or a lotion containing one drachm of formalin in six ounces of spirit to which sulphur ointment to the amount of 2 per cent has been added have been recommended.

Trichomycosis axillaris flava, rubra et nigra. A nodular affection of the axillary hair caused by a *Nocardia* with or without chromogenic cocci.

The disease is confined to hot, damp tropical districts and occurs in both Europeans and natives. It was first described by Castellani in 1911.

The fungus is a fine bacillary organism, *Nocardia tenuis*. This occurs

alone in the yellow variety and in symbiosis with *Micrococcus nigrescens* which produces a black pigment in the black type and with a coccus producing a red pigment in the red variety

Clinical features The affected hairs present yellow black or red nodular excrescences. They are easily removed by scraping The hairs are not brittle. The affection is chronic but usually disappears when the patient returns to a cold climate

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On removing the scale a moist bleeding surface is found. Itching is complained of.

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Mucous membrane lesions. The characteristic white felt like patches of thrush, which are relatively common on the buccal mucosa of bottle fed babies are due to infection with monilia albicans which is readily demon

strated in scrapings The infection is probably much more extensive than the usual inspection suggests for lesions have been seen in the rectum and vagina and on the skin about the mouth and anus Occasionally severe monilia infections involve the whole buccal cavity including the tongue and alimentary tract, and one of our cases ran a febrile course with a toxic scarlatiniform erythema and exfoliated casts of the œsophagus and stomach. Abdominal pain tenderness and diarrhœa indicated the complete involvement of the alimentary tract. Gentian violet was found to be the most effective remedy

White patches on mucous membranes occur in leucoplakia, lichen planus lupus erythematosus, and they have been reported in cases of psoriasis Various types of monilia may be found in the scrapings from



FIG. 220 Moniliasis. Monilia demonstrated by microscope

these lesions but the organisms are ubiquitous and their presence therein may be of no etiological significance Monilia infections of the vulva and vagina are probably more common in diabetic subjects, but the incidence is not known because the lesions escape notice unless irritation causes the patient to seek medical advice These mucous membrane lesions may closely resemble those of oral thrush, but the condition may be more inflammatory and pustular reactions have been recorded

Yeast infections of the skin. Cutaneous moniliasis The most obvious instance occurs in infants with oral thrush when scaly red macules may appear about the mouth and at the angles and in the creases of the alæ nasi where superficial fissures covered with flaky macerated cuticle appear and resemble the condition called perlèche Perianal lesions may also follow oral thrush and may be vesicular or dark red macules which tend to resolve in the centre and to spread in a circinate manner along the perineum to the thighs or in the gluteal cleft where the cuticle is usually

macerated, thickened and white, separating above shallow fissures. This latter manifestation of monilia infection also occurs beneath the breasts and in one variety of mycotic intertrigo of the finger clefts; the other form of interdigital erosion is dry with a shiny red surface and an exfoliating margin suggestive of ringworm. These interdigital yeast infections were described by Fabry under the title of "erosio interdigitalis blastomycetica." In the genito-crural region monilia lesions may be circinate and only distinguishable from tinea cruris by discovering the organism (see Fig. 220). Confusion between tinea and monilia infections is of no practical importance for the yeasts are destroyed by the usual fungicides. Recently we have seen a bullous eruption which appeared to be due to a monilia infection.

Yeast Infections of the nails. Monilia infections of the nail folds are probably more common than is generally recognised, especially in occupations which entail frequent wetting of the fingers, as in fruit pickers and canners, barmaids and kitchen hands. Kingery and Thienes reported that one-third of the employees in a cannery contracted an acute mycotic paronychia and dermatitis during the pear season. In the acute cases interdigital erosions are often present with the painful, suppurative paronychia, but the latter condition may become chronic or develop insidiously and simulate a chronic pyogenic infection. The presence of thickened, sodden, white epidermis in the nail groove may give a clue to monilia infection. Often in chronic mycotic paronychia the nail is involved, and the monilia invasion may be observed to begin under the free edge or lateral fold of the nail plate as an opaque, creamy discoloration which slowly extends to the nail root. The cause of this discoloration is found to be a soft, cheesy mass which separates the nail plate from the matrix and eventually the nail is lost. When the nail groove is involved deformity and discoloration of the nail plate are inevitable. A scraping of the soft subungual hyperkeratosis, mounted in liquor potassæ and warmed on a microscope slide reveals the nature of the infection by a preponderance of round and oval cells; mycelial elements are usually scanty as compared with similar preparations from ringworm of the nails.

Treatment of monilia infections. One per cent. aqueous gentian violet is most useful for monilia infections of the mucous membranes and the paint may be alternated with some other fungicidal ointment for the treatment of cutaneous moniliasis.

Tincture of iodine, containing 5 per cent. each of phenol and thymol is a valuable paint for the nail infections or a spirituous solution of 2 per cent. benzoic and salicylic acid may be tried. The subungual *débris* should be excavated by scraping and the vacant space filled with the paint daily. Phenol. liq. may be used for this purpose occasionally.

African Moniliasis

Infections of the skin with monilia are common in the African native. They are often mistaken for ringworm. In the European the almost universal "prickly heat" of warm climates was considered by E. C. Smith of Lagos to be a moniliasis (*vide infra*).

In the African negro an itching scaly dry eruption of the scrotum is the commonest manifestation. At first the integument is pale and the

strated in scrapings. The infection is probably much more extensive than the usual inspection suggests for lesions have been seen in the rectum and vagina and on the skin about the mouth and anus. Occasionally severe monilia infections involve the whole buccal cavity including the tongue and alimentary tract, and one of our cases ran a febrile course with a toxic scarlatiniform erythema and exfoliated casts of the œsophagus and stomach. Abdominal pain, tenderness, and diarrhœa indicated the complete involvement of the alimentary tract. Gentian violet was found to be the most effective remedy.

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Clinical features. The eruption develops acutely with itching and burning. It is preceded and accompanied by sweating. The back and the trunk and the upper segments of the limbs are affected. The lesions are small acuminate papules and vesicles about the size of a pin's head, containing clear fluid and surrounded by a red areola. The proportion of papules and vesicles varies in different cases. The eruption lasts for a few days, the contents of the vesicles become opaque, and they finally dry up, leaving minute scabs. Owing to the itching and scratching and to pressure, the affected areas may become eczematised or impetiginised, especially in the flexures. In severe cases the buccal mucosa and fauces are acutely congested (Castellani). Miliaria has a great tendency to relapse and the recurrences may be brought about by violent exercise, the taking of hot drinks, etc.

Complications. D. M. Blomfield when stationed at Assab on the Red Sea saw many cases of prickly heat with serious complications during July and August when the intense heat is accompanied by high humidity. He had numerous cases in which multiple deep-seated blisters appeared on the lateral aspects of the middle and terminal phalanges. The blisters were painful until pus was evacuated, when the skin peeled off leaving a raw red surface. The condition ran an indolent course (vide Pyosis tropica, p. 448). Another complication was impetigo of the alae nasi and chin beard and moustache areas. More serious secondary infection caused multiple purulent bullae in the axillae and groin flexures. The psychological effect was serious as the intractability of the eruption incapacitated the patients who had to be sent to more suitable climates where fresh food and vegetables were obtainable. Blomfield held that the axillary and inguinal affection was due to hyperidrosis of the apocrine glands.

Treatment. The underclothing should, if possible, be of silk. Thick woollen materials should be avoided. Frequent changes are necessary and care should be taken to avoid exertion and anything that may tend to induce perspiration. The diet should be simple, very little fluid should be taken and no hot drinks; alcohol should be avoided, and saline and diuretic mixtures given. Bathing the surface with eau de Cologne and water or weak Condy's fluid, and powdering with starch and zinc, or some similar preparation, are comforting to the irritated surface. Macleod recommends the following lotion: Acid salicylic grs. 30, hydrarg. perchlor. grs. 2, spirit vini. rect. oz. 2, aquam ad oz. 6. Baths containing bicarbonate of soda, a drachm to the gallon, also afford relief, together with the use of a mercurial or carbolic soap.

Actinomycosis

(Gk. *aktis*, *(*nos* ray ; *mukes* mushroom)

Actinomycosis of the skin is rare. It is characterised by the formation of chronic indurated and suppurative lesions containing the ray fungus. It may be primary or secondary to infection of the mucous membrane.

Etiology. The actinomyces (*nocardia bovis* and *n. israeli*) grows easily in the human body and is often directly introduced through the buccal mucous membrane or the gums. The habit of chewing grass while walking in the fields is probably a common method of infection, and many of the patients have to deal with cattle and horses and the fungus may be introduced with hay or corn. Lord has demonstrated the organism in the con-

squames fine and powdery In older cases the flakes are larger and may form an intense cast like exfoliation (F C Smith) Under the scales the surface is pink and in striking contrast with the surrounding dark skin As most natives apply palm-oil to the part a filthy condition with secondary sepsis is common. The eruption may spread to the genito-crural fold. The yeast like organisms are easily found in scrapings and they can be cultured on Sabouraud s medium The cultures take four to seven days to develop

The treatment is that for ringworm.

Prickly Heat, Miliaria Rubra, Lichen Tropicus

(*Lat. milium millet seed*)

An acute eruption of papules and minute vesicles at the orifices of the sweat glands attended with itching

Etiology Miliaria rubra is a very common affection in the tropics among white people in the native only the better class is affected A similar affection occurs after severe exercise after vapour baths etc.

Pathology Histologically the process is found to be inflammatory and in that respect differs from that of sudamina. There is a cystic dilatation of the ducts of the sudoriparous glands with swelling of the horny cells at their orifices. Staphylococci are found in the lesions, chiefly the staphylococcus albus and citreus, and by some miliaria is looked upon as a form of impetigo by others it is classed with eczema. The normal sweat is acid, and it has been suggested that alkalinity of the fluid excreted may be the exciting cause of prickly heat.

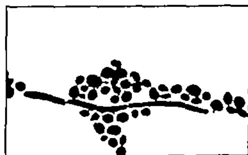


FIG 237 "Prickly heat pores and elementary hyphæ formation from 24-hour culture × 030. Stained by Gram Reproduced by permission of Dr E. C. Smith.

E. C Smith of Lagos reported that colonies of a monilia can be cultivated from the scales on Sabouraud s glucose agar and that he had reproduced the disease in human beings and in monkeys by the application of broth cultures of the organism The period of incubation was from five to twelve days. A coloured picture of this experimental eruption and photomicrographs of the organism are given in his Atlas of Skin Diseases in the Tropics " (Plates XXV to XXVII) The monilia seems to have a close resemblance to the organism found in seborrhœa (p. 201).

Because of these findings we have included prickly heat under monilia infections although as in the case of some of the other lesions attributed to yeasts, the pathogenicity of the monilia isolated has not been fully established There can be no doubt that many of the mild cases of the disease are to be regarded as examples of hyperidrosis in which the normal evaporation of the sweat is retarded by conditions of high humidity or by unsuitable clothing and this results in a follicular irritation, possibly produced or aggravated by low grade secondary infection (vide p. 727)

was the site of infection in the case figured (Fig. 228) and in others we have seen. The thorax, the abdominal wall, and the arms may also be affected, but the disease is exceedingly rare on the limbs.

The primary cutaneous lesion is a nodule in the hypoderm and deep part of the cutis. The surface of the tumour is at first pinkish, and palpation reveals that it has deep attachments. Later the centre of the swelling softens and fluctuates, the skin becomes purplish and then perforates, allowing the escape of a serous, purulent, or bloody fluid containing yellowish grains in which the fungus is found. While this process of enlargement and breaking down is proceeding, other nodules develop in the neighbourhood and fuse together and then pass through the same stages of swelling, softening and the extrusion of the parasite in the discharge. Ultimately an indurated nodular mass is formed with an ulcerated surface from which a number of fistulous tracks pass into the indurated base.

Progress and course. *The infection tends to invade the deeper* tissues, the muscles and bones and liver and it may also attack the blood vessels.

The **diagnosis** of actinomycosis is suggested by the nodosity of the tumours, their agglomeration and chronicity and their deep attachments. The colour of the mass, the foci of suppuration and the situation are also indications, but the diagnosis is made by the demonstration of the ray fungus. *It is remarkable that the glands are not enlarged.*

Actinomycosis of the skin has to be distinguished from dental abscess, which is much more acute and attended with pain. Lupus vulgaris is excluded by the absence of the apple-jelly nodules and scrofuloderma by the character of the pus and the presence of the fungus. Syphilitic gummata are more acute and tend to break down early and the ulcer has a punched-out character. In epithelioma the glands are involved early but a biopsy will set any doubt at rest. Sporotrichosis can only be differentiated by an examination of the pus.

Prognosis. *Actinomycosis is exceedingly chronic and progressive* but treatment has a marked influence if applied sufficiently early and before secondary infection with coccal organisms has occurred. If the disease is allowed to run its course it ultimately proves fatal.

Treatment. Iodide of potassium should be administered in actinomycosis, but it must be given in large doses and steadily increased up to 240 grains a day. Remarkable improvement sometimes follows a course of sulphapyridine or sulphathiazole. Gold therapy may be effective. We know of one case which responded to penicillin. Vaccines, preferably autogenous, in doses of half a million gradually increased to fifty million elements have been given with success. The injections are made every three to seven days.

Incision and scraping of the sinuses with injection of 1 per cent. solutions of sodium or potassium iodide often hasten healing, and applications of X rays are *of service. Doses of 150 r* may be given weekly for three weeks. Irradiation is especially valuable after scraping.

Nodular tumours in the subcutaneous tissue caused by other varieties of Nocardia have been described. In one form the nodules are juxta-articular (Jeanselme).

tents of carious teeth and successfully inoculated guinea pigs In cattle it is the cause of wooden tongue The disease occurs in all countries but apparently is more common on the Continent than in the British Isles.

Pathology The organism is found in the pus or in the tissues in the form of yellowish grains about 1–250 to 1–25 inch in diameter visible to the naked eye in the pus It is composed of a mycelium forming a small mulberry like mass from which extend thick refracting radiating processes. Cultures are not easy to obtain unless the pus-cocci are inhibited by anaerobic conditions The filaments segment into spores when grown

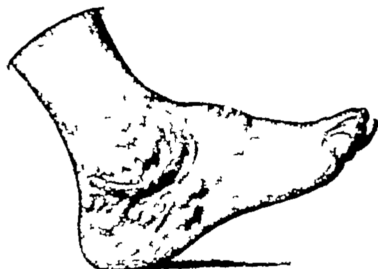


Fig 228. Actinomycosis. Case seen with the late Mr H L. Barnard.

on appropriate media. The inoculation of animals is difficult, but has been successful in cows. The parasite causes a leucocytic reaction and proliferation of the fixed cells to form nodules Giant cells plasma cells and epithelioid cells are found in the nodules, and around them there is a zone of leucocytes and connective tissue cells. The vessels are often involved

Clinical features. Cutaneous actinomycosis is rarely primary in most cases the skin becomes infected when the parasite is being extruded from lesions of the deeper structures On account of the frequency of infection of the buccal cavity the seats of election are the face and neck, which are attacked in more than two-thirds of the cases A decayed tooth

PLATE 12



Mycetoma or Madura Foot

From a water-colour drawing by Colonel A. D. P. Hodges.

Actinomycosis cutis interdigitalis (Ulcus interdigitale) Acton and Maguire describe a form of actinomycosis limited to the skin It occurs commonly in coolies in the tea gardens in India, Ceylon and the Philippines. They hold that it is the same condition which has been described as *ulcus interdigitale* and keratoma plantare sulcatum.

The causative agent is *Actinomyces keratolytica,* which stains with toluidin blue

Clinically the interdigital ulcer starts with itching between the toes A fissure develops and passes on to form an oval ulcer The lesions are very painful Actinomycosis cutis plantaris is caused by the same parasite Its characteristics are a painful pitted condition of the heel and tread of the foot.

The conditions occur at the beginning of the rainy season. Both are easily cured the interdigital ulcers by the application of a 2 per cent. solution of gentian violet in distilled water and the plantar lesions by painting once daily with a 20 per cent formalin solution

REFERENCES—C. MAGUIRE. "Ulcers in the Tea-Gardens. Calcutta, 1931 Published by the Indian Tea Association.

Mycetoma or Madura Foot

This disease is endemic in India and East Africa, and is seen occasionally in North and South America It appears to be caused by several vegetable organisms In some instances a streptothrix closely related to the ray fungus has been found in other cases a form of mucedo and numerous other fungi and an aspergillus have been demonstrated.

The disease starts in the sole in natives who go barefooted rarely in the hand or knee by the formation of nodosities which soften and allow a *sanious fluid containing the parasites to escape* Bullæ appear on the lesions and the breaking down of the nodules leads to the formation of fistulous tracks from which granular masses resembling fish roe are extruded These masses contain the organisms White, red and black lesions have been observed Their structure closely resembles that of a syphilitic gumma, and the infiltration may slowly spread until the whole of the foot is involved The swollen foot is gravely deformed and in a condition of pseudo-elephantiasis (Plate 42) while the rest of the leg undergoes atrophy and thus increases the disproportion between the enormously swollen extremity and the remainder of the limb The disease is essentially chronic, often lasting for many years

Treatment. Iodides have some influence in the early stages of the disease but in most instances surgical interference becomes necessary

REFERENCES—M. DES LIGNERIS, *Journ Med Assoc S Africa,* 1928 2, 10
R. C. SMITH *Trans Roy Soc Med Hyg* 1928-9 22, 157

Mossy-foot

A papillomatous affection of the feet and adjacent part of the legs occurring in the Amazon Valley and in Honduras A similar condition occurs locally in Kenya.

The foot and ankle are covered with closely packed warty excrescences

The appearance is well shown in the illustration (Fig. 220). The lesions are painful and bleed easily. The sole usually escapes. The disease is



FIG. 229. "Mossy Foot" in Kenya African, showing the pressure surface of sole and heel free from papillomata. (Courtesy of Dr. Malcolm Clark.)

autoinoculable and may last for many years. The organism believed to be causative is a fungus *Phialophora verrucosa*.

Dr. Malcolm Clark showed Sequeira a number of African patients from the Fort Hall district of Kenya, who were suffering from a form of "mossy foot" (Fig. 230). The patients were adults of all ages, and the condition was usually symmetrical. The edges of the soles were first affected and the papillomatous

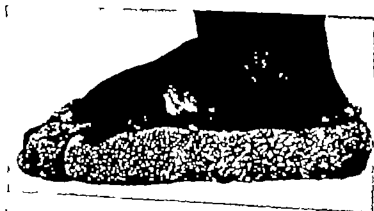


FIG. 230. Mossy Foot in Kenya African. In advanced cases the dorsal surface of the foot is also involved. (Courtesy of Dr. Malcolm Clark.)

excrescences were closely packed. In more advanced cases the dorsa of the feet were involved. The legs were free and there was no oedema. The condition runs a very chronic course, but even after years the skin of the soles where the pressure was borne was quite smooth and soft. Extensive investigations failed to disclose any causative parasit. The blood was free from microfilaria.

Lowenthal first drew attention to the fact that other conditions have been described as "mossy foot." A somewhat similar papillomatosis verrucosa ...

be large purulent collections in the retropharyngeal region, in the psoas and other muscles, and in the fascial planes.

Clinical features. The earliest manifestation is a small dry papule covered with a crust. It gradually enlarges to form a plaque the size of a coin or larger. The edge of the plaque is shelving and of a dark red or purplish colour and in it are minute abscesses visible often only with a lens. The lesions are soft and boggy and the surface is covered with warty or small fungating excrescences. On puncturing one of the abscesses a peculiar glairy muco-pus can be withdrawn, and in this the blastomycetes are found. The disease progresses slowly and large areas may be involved. Ultimately cicatrisation may occur.

There is no part of the skin which is exempt, but the face, hands, including the nails, and arms are most commonly affected. Systemic blastomycosis has been described by Hyde, Montgomery, Ormsby and others. The general symptoms are those of a chronic pyæmia, with the formation of multiple abscesses in various parts of the body. There are irregular fever, wasting and exhaustion, with symptoms due to the local infection of the different organs, particularly the lungs, kidneys, etc. The general infection may be secondary to the cutaneous disease, or the primary trouble may be in the lungs and bronchi, with secondary involvement of the skin and subcutaneous tissue.

A curious variety of blastomycosis confined to the buttocks occurs in Egypt and the East. It runs a very chronic course.

Diagnosis. Blastomycetic dermatitis has to be distinguished from the warty forms of tuberculosis and from syphilitic gummata. The miliary abscesses at the margin of the lesions may raise a suspicion, but microscopic examination is the only safe guide to the diagnosis. The systemic form simulates pyæmia, tuberculosis, rheumatism and other general infections. The organism may be demonstrated in the sputum and in the pus drawn from the abscesses. The absence of tubercle bacilli and of the reaction to tuberculin are of some, but little importance.

The disease called coccidioidal granuloma (*infra*) is not a form of blastomycosis.

Prognosis. The prognosis is favourable if the disease is limited to the skin.

Treatment. Large doses of iodide of potassium have a pronounced influence and in combination with radiotherapy have often been sufficient to effect a cure of the cutaneous affection. Small lesions may be excised.

Coccidioidomycosis (Coccidioidal Granuloma). This affection which is caused by the yeast-like organism, *Coccidioides immitis* has a limited distribution, being endemic in the San Joaquin valley in California. There has recently been acquired evidence that small rodents may be the reservoir from which the soil is infected. The disease occurs most commonly in negroes and is ten times as frequent in the male as in the female. The so-called "valley fever" of the region has been shown to be a mild and often unrecognised stage of coccidioidal disease.

The granulomata begin as dusky red papules or nodules on exposed parts of the skin. Ulceration follows and the deeper tissues may be involved. Large areas may be affected. The ulcers run an indolent course but end in necrosis. The muco-purulent discharge contains the causative organism. In ulcers of long duration papillomatous excrescences may form. Provided the disease is

occurs in elephantiasis (Plate 9)

The most satisfactory treatment of the old warty masses is destruction by the thermo-cautery Elastic adhesive bandages should be tried in early cases to retard the development of papillomatosis

Blastomycosis Blastomycetic Dermatitis

(Gk. *blastos* germ or sprout *mukes* mushroom)

Blastomycosis was described by Gilchrist in America and by Busse and Buschke in Germany in 1894 It is a chronic infectious disease characterised by the formation of nodules and warty growths containing multiple minute abscesses. As a rule, the skin is primarily affected, but rarely the disease may become disseminated throughout the body

Etiology Blastomycosis is caused by a pathogenic yeast fungus. Yeast fungi are occasionally found in connection with other organisms in some ulcerative skin lesions In the condition now under consideration the lesions are due solely to the blastomyces Most of the cases on record have been seen in Chicago and its neighbourhood and in other parts of the United States, but the disease has been seen in Europe and in India, Japan and South America Sequeira reported one case in a patient who had always lived in the country and had a local reputation as a pig doctor

A remarkable case of systemic blastomycosis with cutaneous lesions was shown at the Royal Society of Medicine by Dowling The patient, a young man, had been employed in breaking up wooden packing cases which had come from the United States

The disease commonly occurs in adults between the ages of thirty and fifty It is more frequent in men than in women, and the majority of the sufferers have lived in bad hygienic surroundings.

The allied affection, coccidioidomycosis occurring in the Joaquin Valley in California, is due to the *coccidioides immitis* (see below).

Pathology The organism is a rounded or ovoid yeast like body often showing bud formation. The capsule has a double contour The blastomyces can be grown on glucose agar and other media, and forms white cotton wool like cultures In the older cultures there is a mycelium which shows some evidence of sporulation. Guinea pigs, rats and mice can be experimentally infected and the organism can be recovered from their lesions

Castellani and Jacono s paper (1933) analysing the characteristics of the fungi should be consulted. They limit the terms blastomycosis to disease caused by fungi with complete absence of mycelium Redaelli and Ciferri examined the whole group of organisms found and propose to form a separate genus under the name of *Gilchristia dermatidicis*

The microscopical anatomy of the lesions is peculiar There is an enormous increase in the rete mucosum, which sends down irregular processes containing minute abscesses full of polynuclear cells, a few giant cells, and the organism. In systemic blastomycosis the lungs are always affected, and abscesses varying in size from minute miliary collections of pus to cavities containing a pint or more are found. The abscesses are also found in other organs including the brain, the spinal cord, and the serous cavities, and the joints and bones including the vertebræ. There may also

be large purulent collections in the retropharyngeal region, in the psoas and other muscles, and in the fascial planes.

Clinical features. The earliest manifestation is a small dry papule covered with a crust. It gradually enlarges to form a plaque the size of a coin or larger. The edge of the plaque is shelving and of a dark red or purplish colour and in it are minute abscesses visible often only with a lens. The lesions are soft and boggy and the surface is covered with warty or small fungating excrescences. On puncturing one of the abscesses a peculiar glairy muco-pus can be withdrawn, and in this the blastomycetes are found. The disease progresses slowly and large areas may be involved. Ultimately cicatrisation may occur.

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The granulomata begin as dusky red papules or nodules on exposed parts of the skin. Ulceration follows and the deeper tissues may be involved. Large areas may be affected. The ulcers run an indolent course but end in necrosis. The muco-purulent discharge contains the causative organism. In ulcers of long duration papillomatous excrescences may form. Provided the disease is

limited to the integument the outlook is favourable and the lesions heal leaving depressed atrophic scars but coccidioides not only involves lymphatic glands but attacks the viscera more frequently than the skin producing pulmonary osseous, cerebro-spinal and other widely-spread lesions.

Treatment should be on the same lines as for blastomycosis

REFERENCES—MONTGOMERY RYFKOGEL and MORROW *Journ Cut. Dis.*, 1903, p. 5, and 1904 p 308 DICKSON *Californ West. Med.*, 1937 47 151 ARONSON *et al.* *Archiv Path* 1942 34 31 CASTELLANI and JACONO *Journ Trop Med. and Hyg.*, 1933 36, 207 to 321 Plate 38 figures and references REDAELLI and CIFERRI *Ibid.*, 1934 37 280 References. "Exotische Blastomykosen. JADASSOHN'S *Handbuch der Haut u Geschlecht Krankheiten* 12, 1 80

Sporotrichosis

(Gk *spora* seed)

Somewhat similar granulomatous conditions are caused by sporotrichia The earliest cases were described in 1890 by Schenck De Beurmann and Gougerot s researches have added considerably to our knowledge of these cutaneous affections

Etiology The sporotrichia are lowly vegetable organisms of the mucedo group The mycelium consists of regular septate or continuous



FIG 231 Sporotrichosis. (Reproduced by permission of Dr W J O Donovan.)

filaments with short spore bearing branches. The spores vary in size from 3 to 6μ and occur singly or in pairs on the filaments or conidia. The *sporotrichum beurmanni* is the best known. Cultures can be grown on gelose glucose at the normal temperature they take about six days to develop and by the end of the second week are luxuriant. The cultures have a characteristic appearance at first they are white and somewhat pointed, but later gradually become brown and flatten to form areas with

convoluted borders and with radiating filaments. De Beurmann obtained positive results from inoculation of animals.

It is not yet known how the organism attacks the skin, but it is believed to be derived from animals and to be introduced through small breaches of the surface. Infection by the buccal mucosa appears also to be probable.

Pathology. The lesions are inflammatory nodules with central suppuration. Gougerot described three zones, the outer consisting of perivascular cellular infiltration resembling that seen in the syphilides. The middle zone is more like a tuberculous infiltration and giant cells are present. In the centre there is a suppurative area with polynuclear infiltration. Sometimes portions of the mycelium are met with in sections and in the pus.

Clinical features. The lesions produced by the sporotrichia are of various forms, but it may be stated generally that they fall into two groups, one resembling the manifestations of syphilis and the other those of tuberculosis. The primary lesion is followed after a short interval by a subcutaneous nodule which enlarges to the size of a small nut. This ultimately softens and discharges. A succession of several such formations develops along a lymphatic trunk which can be felt as a cord. Some of the lesions do not break down. They may increase to the size of a small orange, and after some months a gradual involution occurs. The lesions may be grouped or widely spread, and the subcutaneous tissue, the bones and joints and the mucous membranes and viscera, *e.g.*, lungs, kidneys etc., and special sense organs may be attacked.

The common clinical types are (*a*) a sporotrichic "chancre" with associated lymphangitis, (*b*) disseminated nodules and tumours, (*c*) disseminated ulcers. The lesions resemble the warty form of tuberculosis, the ulceration of Bazin's disease, ulcerating tertiary syphilides, ecthyma and boils. All these conditions leave scars which closely resemble the cicatrices of syphilis. In many cases the general health is very little affected.

Diagnosis. The importance of recognising sporotrichosis is evident from the clinical features briefly indicated above. The diagnosis depends upon the multiplicity of the lesions and the variety of their forms and the viscous character of the pus which exudes from the broken-down tissue. The patient's health is usually unimpaired. The actual diagnosis is made by culture, which takes from one to two weeks, and by Widal's agglutination reaction. We have seen a number of cases with all the clinical features of sporotrichosis, but repeated cultures and examinations of films failed to confirm the diagnosis, so the etiology of these granulomata remained obscure. The serum of patients suffering from sporotrichosis agglutinates an emulsion of the sporotrichia spores. The serum of sufferers from actinomycosis also agglutinates this emulsion, but in a *different* titre.

Prognosis. If untreated the lesions multiply and extend. They readily yield to iodides.

Treatment. In most cases a course of iodides for two to eight weeks duration causes the disappearance of the lesions. Twenty grains should be given thrice daily and 10 minims of Lugol's iodine solution in milk, t.i.d. is also useful. Suppurative nodules are punctured and injected with

1 per cent iodine solution Dressings of lotions of similar character are used Relapses are common if the treatment has not been carried out strenuously

Hormodendrum dermatitis. This rare fungous infection is thus described by the late Dr E C Smith of Lagos "The appearance of the lesions differs distinctly from the more common ringworm and monilial infections They occur as dry slightly raised irregular patches with a broken crumbly surface which on removal exposes to view a raw base with a tendency to ooze Other areas may occur covered with heaped up epithelial scales resembling psoriasis and they may be surrounded by areas of hyperpigmentation The condition may be confined to the limbs or it may be widespread the nails may be extensively involved They may become atrophic and distorted by the accumulation of a granular friable material between them and the subjacent skin and apparently brought about by the fungus Mycotic elements can be readily demonstrated in scrapings or in the crumbly material removed from beneath the nails and in appearance is rather characteristic the component elements here showing for the most part as transversely marked filaments broadening out towards their extremities in a club-like manner Lateral branches and buds occur and free yeast like forms may be seen The fungus is Gram positive and on Sabouraud's medium appears *within four to six days as a velvety green culture darkening later* and becoming heaped up and furrowed Under the microscope the stratum corneum shows a laminated parakeratosis densely infiltrated with inflammatory cells The Malpighian layer is acanthotic and the corium shows inflammatory reaction. Treatment has proved unavailing

Rhinosporidiosis. *This disease is caused by a yeast like organism Rhinosporidium seeberi* which affects the nasal mucosa It is rather a rare affection but has been seen in a number of tropical countries and in the United States The infecting organism causes polypi and tumours. The trouble begins in the nose but may reach the cheeks the conjunctiva and the *lachrymal sac It has also involved the uvula* The lesions are said to have cleared up after intravenous injections of antimony tartrate Polypi are removed surgically

CHAPTER XXI

ACUTE BACTERIAL INFECTIONS OF THE SKIN

Erysipelas — Impetigo — Erysipeloid — Folliculitis — Boil — Carbuncle
Coccogenic Sycosis — Diphtheria of the Skin — Anthrax — Glanders.

PATHOGENIC organisms are present only as individual units upon the normal skin and they are unable to invade the dry intact stratum corneum. Probably they are inhibited by the acid reaction of the normal secretions, pH5 or thereabouts, but this protection is lessened by frequent washing and especially by maceration and contact with alkalies. Through such causes or as a result of trauma producing breaches in the skin surface, the bacteria find favourable conditions for growth and infection results. Under certain conditions it appears probable that the *pityrosporon ovale* ("bottle bacillus"), the *acne bacillus* and the *staphylococcus albus* normally saprophytic on the skin, may become pathogenic. However the more virulent organisms are acquired directly from an infected subject. The healthy skin possesses considerable powers of localising and combating infections and undoubtedly contributes largely to the general immunity. So the longer the infection is localised as a skin lesion the less likely is the patient in danger of systemic infection. On the other hand, the introduction of a pathogenic organism below the skin has often led to a severe and sometimes fatal septicaemia.

The common microbes causing cutaneous lesions are —

(1) The pus-cocci, particularly streptococci and staphylococci which may give rise to similar lesions (see nail infections paronychia etc. p. 780).

(a) The streptococci in erysipelas, lymphangitis, several forms of impetigo and whitlow;

(b) the pyogenic staphylococci, producing impetigo, boils, carbuncle, sycosis, cutaneous abscesses

(2) Monilias and the "seborrhoeic triad"—the pityrosporon, acne bacillus and *staphylococcus albus*—associated with intertrigo, moniliasis and seborrhoeides;

(3) the strepto-bacillus, hæmophilus ducreyi in the soft chancre

(4) the tubercle bacillus in lupus vulgaris, scrofuloderma, and other varieties of cutaneous tuberculosis

(5) the bacillus of Hansen in leprosy;

(6) the bacillus anthracis in malignant pustule;

(7) the bacillus mallei in glanders (farcy)

(8) the Klebs-Loeffler bacillus in diphtheria of the skin, veldt sore and barkoo rot;

(9) the bacillus of Frisch in rhinoscleroma

(10) the treponema pallidum in syphilis

(11) the treponema pertenue in yaws;

(12) the treponema of pinta.

PUS-COCCAL INFECTIONS OF THE SKIN

The common streptococcal infections are some varieties of impetigo and erysipelas.

Streptococci are cocci arranged in chains of greater or less length, but

sometimes in pairs only (diplococci) They prefer anaerobic media and grow best at the body temperature They do not liquefy gelatine.

The streptococci differ very much in their virulence but those met with in skin practice probably all belong to one variety the *Streptococcus pyogenes* of which many pathogenic types have been identified Streptococci are commonly found in the cavity of the mouth but they are less common on the normal skin than the staphylococci

Erysipelas

(Gk. *erythros* red *pella* skin)

Erysipelas is an acute inflammation of the skin and subcutaneous tissue caused by the *Streptococcus pyogenes* invading the lymphatics

Etiology The organism gains entrance by a breach of the surface



Fig 232. Erysipelas.

of the skin or an *adjacent mucous membrane* *e g* that of the nasal cavity The breach of surface may be obvious as in the erysipelas of wounds burns, scalds and the like or it may be microscopic and impossible to locate. The patients are generally young adults, between twenty and forty but no age is exempt.

Epidemics in surgical wards were common before the introduction of antiseptics.

Symptoms. A rigor usually marks the onset of the disease. The temperature rises rapidly to 102° to 105° F., and there are the usual symptoms of fever—malaise, headache coated tongue and thirst. The temperature shows remissions in the morning and rises in the evening and an extension of the eruption is often indicated by a further rise of the temperature. As the disease progresses the furred tongue becomes dry and brown, there are sordes on the lips and the patient may pass into a "typhoid" condition. In severe cases vomiting and delirium occur. The urine may contain albumen and casts.

The initial lesion is a small raised shining red area with a well-defined margin, tender and hot to the touch. Where the subcutaneous tissue is lax, as in the eyelids, there is great swelling, and the swollen lids may completely close the palpebral fissure. If the affected area lies over a flat surface of bone there is very little swelling but the tenderness and pain are more pronounced. In the centre of the patches small vesicles and bullæ containing clear serum are common. The clear fluid may become purulent and dry into crusts. Heat, pain, and itching are complained of. In four or five days the eruption at any one part fades and desquamation follows. A characteristic of the disease is the peripheral extension of the area, but in the form called erysipelas migrans the eruption appears in one part of the body and, rapidly subsiding there, reappears in another region, and such attacks may go on for some weeks. It is very unusual for abscess formation to arise, but it may do so and necessitate incision.

Erysipelas may attack any region, but the face is the most frequently affected. From the face it may spread to the scalp and on to the neck. If the scalp is affected the hair usually falls, but grows again.

With the decline of the eruption the temperature drops to the normal by lysis, the subjective symptoms gradually disappear the tongue cleans, but the patient is often left enfeebled, and convalescence may be tedious. In young healthy adults, however the improvement may be rapid. Mild attacks, especially those complicating surgical wounds, may be apyrexial and practically symptomless as may recurrent attacks of erysipelas (see Erysipelatoid p. 442).

Duration. In a mild case the disease clears up in a week to ten days, but a duration of three weeks or more is not uncommon.

Recurrences are frequent, especially where the disease attacks the alæ of the nose and the cheeks, and repeated outbreaks lead to great thickening of the parts, a form of elephantiasis (Figs. 61 and 62).

Diagnosis. The well-defined margin is sometimes absent, and this may lead to difficulty but the tense shining red areas with minute vesicles upon them, together with the constitutional symptoms, fever etc. are generally sufficient to make a diagnosis.

Erysipeloid—infection with the *b rhusiopathia suis* Erysipeloid results from abrasions in those handling pork, bacon, fish, fowl, rabbits, etc., and generally occurs on the hands. Clinically it closely resembles erysipelas, but there is no constitutional disturbance (see p. 450) and vesication is unusual.

Erythematous eczema of the face is often diagnosed as erysipelas; in

both there are redness and swelling of the eyelids but in eczema there is little or no rise of temperature and the general symptoms of erysipelas are absent.

Dermatitis due to plants may easily be mistaken and also solar erythema But in these there is no pyrexia

Acute lupus erythematosus or acute toxic erythema may simulate erysipelas but the onset and course of the disease will suggest the correct diagnosis while the swelling and definition of the lesions are less marked than in erysipelas

The **prognosis** is good except in the debilitated or in those addicted to intemperance or suffering from Bright s disease In the very old and in young infants the prognosis is grave.

Treatment. General The patient should be confined to bed. Cardiac stimulants such as strychnine and digitalis may be necessary

Before the introduction of penicillin and the sulphanilamide group of drugs antistreptococcal serum and shock therapy (aolan) were often employed with advantage Sulphanilamide is specific for this type of streptococcal infection and one gramme should be given thrice daily for three days and 0 5 gramme t.i d for five days Larger and more frequent doses should be given if the constitutional reaction is severe Ascorbic acid 50 mgs t i d and glucose may be given at the same time to prevent toxic reactions to sulphanilamide Penicillin may be given as intra muscular injections in doses of 50 to 100 000 units every three hours until the local and systemic symptoms have disappeared This therapy although quickly effective as a rule, is obviously more tedious than a sulphonamide by mouth and should be reserved for the severe cases. Local erythema doses of ultra violet light often cause rapid involution but irradiation should not be combined with chemotherapy

Local The parts should be covered with ichthyol 20 to 40 per cent. in glycerin, applied in the form of a paint Hot lead lotions are comforting *In the recurrent form starting from the nose* the nasal cavity should be treated and if there are abrasions with suppuration sulphanilamide or sulphathiazole powder may be used as a snuff

Lymphangitis. An infection of the lymphatics by streptococci may follow wounds or any slight trauma which involves a breach in the defending epidermis Recurrent cases are commonly seen in filarial infection and may lead to elephantiasis (*vide* p 132) The infection is attended with pyrexia, and occasionally with rigors and with rapid pulse and other febrile symptoms The affected parts are swollen and painful Irregular red areas or streaks appear in the course of the lymphatics and the lymphatic glands draining the area are swollen and tender Lymphangitis of filarial or non filarial origin responds favourably to the administration of sulphapyridine The initial dose should be 4 grammes and doses of 1 gm should be continued for four or five days Penicillin is also of value

Erysipelatous attacks may recur and should receive the same treatment

Recurrent Erysipelatoid Eruptions on the face or limbs which may or may not lead to persistent œdematous swelling of the lips eyelids, and other parts are not uncommon They are believed to be of streptococcal origin and are often associated with septic conditions of the nasal and oral mucosa The first attack is the most severe and may present the usual

features of erysipelas. However the subsequent attacks rarely show vesication on the oedematous red area or are accompanied by fever and malaise. It is therefore thought that the eruption is mainly an allergic response to the streptococcus.

A form of elephantiasis may result (Figs. 61 and 62).

A careful search for and removal of septic foci in nose and throat, accessory sinuses, teeth and jaws and ears is essential. Fissures—though they are often indicative of deeper infection—may be primary and should be dealt with. Cracks between the toes may be due to a ringworm infection and require appropriate treatment. Erysipelatoid attacks frequently complicate the chronic elephantiasis due to tuberculous lymphangitis from skin tuberculosis in a limb.

Apart from removal of the source of infection where possible, sulphonamide therapy general ultra violet light irradiation of the whole body and vitamin A by mouth should be tried.

Treatment. We have had some experience with parenteral penicillin in cases of recurrent erysipelas; a few cases appear to be cured, some are improved, the frequency of attacks being greatly reduced; but some cases are not affected by the treatment. Vaccine therapy is sometimes helpful, but these cases are often most difficult to control. Local X-ray therapy may be successful, 3 or 4 doses of 50–100 r being given to the affected area at intervals of two weeks.

Impetigo contagiosa

(Lat., *impetere* to attack)

Impetigo contagiosa or phlyctenular impetigo is an acute inflammation of the skin surface characterised by the formation of flat vesicles or bullæ which become pustular. It is caused by the *streptococcus pyogenes* and also by the *staphylococcus*. In fact recent work suggests that *staphylococcus aureus* is the more frequent cause of bullous and circinate impetigo in this country and the U.S.A., but the rapidity with which the streptococcus is outgrown by the staphylococcus may account for erroneous conclusions.

Etiology. Children are more often affected than adults, and in out patient clinics impetigo contagiosa is one of the commonest diseases. Outbreaks in boarding schools are frequent. "Scrum-pox" is a schoolboy's name for impetigo. Auto-inoculation is frequent and the disease rapidly



FIG. 243. Impetigo contagiosa. Phlyctenular impetigo. Diagrammatic (after Darier).

spreads from one individual to another where there is close contact. This accounted for the large number of cases seen during the war. In men the infection often takes place in the barber's shop.

Diseases like scabies, pediculosis and other parasitic affections, in which there is severe itching, are commonly complicated with impetigo

Eczema and other forms of dermatitis in which there are moist surfaces also afford a suitable ground for pus-coccal infection To describe this secondary infection the word "impetiginisation" is often used Sabouraud has shown that the streptococcus can be obtained from the lesions in pure culture by growing them on fluid media in a capillary pipette if the exudation is taken from the vesicles early Inoculation experiments gave positive results In most cases the staphylococcus invades the lesions and cultures made on solid media show abundant *growth of these organisms.* It appears certain, however from the researches of various workers



Fig 231 Circinate impetigo. Two weeks duration. Cured in seven days.

that staphylococci are sometimes the cause of common impetigo in all its varieties

Pathology The lesions of impetigo contagiosa are superficial The epidermis is elevated by an effusion of serum which rapidly becomes opaque and purulent There is a moderate amount of leucocytic infiltration in the corium In ecthyma the epidermis is destroyed and there is ulceration of the true skin leading to scarring The ulcer has a shelving edge (Fig 230)

Clinical Forms of Impetigo —

Common type. The eruption begins as flat vesicles containing clear fluid which becomes purulent and rapidly dries, forming yellow crusts. As a rule when the patient first comes under observation the lesions are already yellow or yellowish brown or greenish crusts varying in size from a pea to a sixpence or larger They appear to be stuck on, as Tilbury Fox pointed out. On removing the crust from a recent lesion a red oozing

PLATE 43



IMPETIGO CONTAGIOSA

[To face p. 44

surface is exposed, but when the spots are dying away the subjacent area is dry

Minute papules and vesicles are occasionally seen in association with the typical phlyctenules (Plate 43).

The eruption itches slightly and auto-inoculation is exceedingly common. By scratching and simple contact fresh spots form with great rapidity and large areas may be involved. Lesions may appear on distant parts, *e.g.*, the fingers, where phlyctenular whitlow is not uncommon. Impetigo often spreads from one member of a family to another

No parts of the body are exempt, but on account of exposure, those most commonly affected are the face, particularly about the mouth and nose, and the scalp and nape of the neck. In the occipital region the exciting cause is usually the irritation of head lice and in impetigo of the head and face the hair should be examined carefully for pediculi and their ova in all cases.

The infection of the skin by the pus-cocci rapidly leads to swelling and tenderness of the lymphatic glands which drain the area involved. The submental, submaxillary and occipital glands are the most commonly affected, and suppuration may occur

Erysipelas is a rare complication. Albuminuria and rarely acute nephritis may occur Occasionally a sensitisation rash—a streptococcide—arises from blood-borne toxins and may be scarlatiniform, follicular acneiform, lichenoid or finely scaling

Intertrigo type. Pus-coccal intertrigo. In the post-auricular sulcus and in the joint flexures, particularly the groins, impetigo takes a different form. The constant apposition, together with the warmth and moisture of the parts, causes premature rupture of the vesicles, and instead of the characteristic yellow crusts, red oozing surfaces are formed. Phlyctenules of the common type are often present at the margins of the raw areas and elsewhere, and they give a clue to the exact nature of the process It must be remembered that simple intertrigo caused by chafing may become impetiginised, and that coccal infection is often an epiphenomenon in eczema and dermatitis due to irritants.

Bullous type (Lat. *bulla*, bubble). Sometimes a few blebs occur in association with the vesicles and crusts above described, but occasionally all or most of the lesions are of the bullous variety Instead of rapidly drying up into crusts, the vesicles enlarge until blebs or blisters of considerable size are formed. They may be as large as a small walnut. The fluid contents are clear at first but rapidly become opaque and may get purulent. Occasionally the upper layers of the fluid in a bulla are clear while the dependent portion is purulent, a condition recalling hypopyon. Impetigo, like urticaria, tends to be bullous more often on the lower extremities and more commonly in younger patients. The name "pemphigus contagiosus" was given by Manson to epidemics of bullous impetigo seen in the tropics. Castellani believes them to be due to pyogenic staphylococci. Cantlie described a virulent streptococcal infection occurring in hot seasons in the tropics, producing bullæ on the soles. The blebs rupture and are followed by desquamation. The disease may follow ringworm infection There is intense itching.

Bullous impetigo of infants. Pemphigus neonatorum. This form

of impetigo requires special consideration At one time classed as a variety of pemphigus, it is now recognised as being caused by pus-cocci, and therefore is to be grouped with impetigo Early observers found staphylococci in the fluid of the lesions, but Sabouraud, Whitfield and others isolated streptococci by special methods, believing these organisms to be causal and the staphylococci a super infection The recent researches of Jadassohn and Hofmann and others suggest that this view must be reconsidered and that the condition is usually caused by staphylococci Cole and Ruh, in an epidemic in a maternity hospital



FIG 235 Pemphigus neonatorum, Fatal case Bullous impetigo in brother and sister

found *Staphylococcus aureus* in fluid from unbroken blebs in all cases examined and in the pulmonary and hepatic veins in a fatal case

Clinical features The eruption occurs in young infants usually before the umbilical stump has healed and it is possible that this breach of surface in the normal infant may be the site of infection

The eruption consists of blebs or bullæ of all sizes from a small pea to a nut and on the whole the large blebs predominate The lesions are scattered widely over the trunk and less frequently upon the limbs, the palms and soles not being specially picked out by the eruption as in the congenital bullous syphilide The blebs contain clear fluid which may become opaque and purulent The surface left by the removal of the

raised epidermis by friction or otherwise is raw red or moist, and the lesions dry up with the separation of flakes from the margins. Some nails are often involved in a purulent onychia or paronychia.

The mother or the nurse may be suffering from impetigo of the common bullous type or from whitlow and there may be common phlyctenular impetigo in other members of the family. Small epidemics sometimes occur in institutions or in the practice of a midwife or maternity nurse and in such instances systematic examination of the nurses' throats is essential. Many epidemics have been traced to nurses who are carriers of virulent staphylococci or streptococci and the "carrier" should be isolated, treated for the septic focus in the throat and given a long convalescence and not allowed to nurse the newly born until negative swabs have been obtained. The disease is dangerous, because the infection may become generalised. In an autopsy upon one case Sequeira found the urachus distended with pus and has several times seen suppuration in the course of the umbilical vessels. The organs generally show evidence of septic infection.

The prognosis depends essentially upon the extent of the eruption and



FIG. 224. Ecthyma.
Diagrammatic (after Darier).

involvement of the umbilicus. If this can be kept clear of infection the prognosis is excellent; if the umbilicus gets infected it is grave.

Some rare cases of generalised exfoliative dermatitis in infants first described by Ritter von Rittershain appear to be a severe form of infection by pyogenic cocci. The early cases of an epidemic of pemphigus neonatorum often tend to be of this type and the prognosis is serious.

The bullous impetigo of infants has to be distinguished from the bullous congenital syphilide which appears occasionally at or within four or five days of birth. The spirochaetal eruption specially favours the palms and soles and is usually accompanied by macular and other lesions, a dull red colour on the face and elsewhere and by snuffles.

Circinate type. This variety of impetigo simulates an acute ringworm infection. The lesions enlarge rapidly but without much fluid exudation. The central parts heal, and thus rings are formed, which may cover large as

Ulcerative impetigo. Ecthyma. In poorly-nourished and debilitated subjects, especially children recovering from acute specific fevers, streptococcal infection may cause deeper lesions called "ecthyma." Many cases of this type occurred among soldiers on active service, the pyogenic infection often being secondary to scabies and pediculosis. The gluteal region, thighs and legs were the parts most often involved. Ecthyma was more prevalent amongst those suffering privation as prisoners of war or when engaged in desert or mountain warfare.

The eruption consists of vesicles which dry up to form crusts of a dirty *brown colour differing in this respect from the yellow scabs of impetigo.* Around the crust a ring of small vesicles appears, and when the scab is removed a shallow slightly cupped ulcer is found (Fig 230) There may be grave general symptoms and in all cases the lesions are more difficult to heal than those of common impetigo They leave permanent scars, and sometimes infiltrated nodules which may last a long time Secondary warty growths occurred among soldiers in France (1914–18) (MacCormac). The vacciniform and varicelliform ecthymatous eruptions are dealt with elsewhere, being probably due to mixed infection (p. 451)

Pyosis mansoni (Pyosis tropica) occurs frequently in Southern China and the Far East, in Ceylon and Southern India and in North Queensland and tropical America. European children suffer more than the natives The eruption begins with small red spots which rapidly become vesicles and pustules Any part of the body or limbs may be affected in children. In adults the flexures usually suffer A lotion of 1/1 000 perchloride of mercury followed by dusting with a powder containing equal quantities of boric acid, zinc oxide or starch is advised As strepto- and staphylococci are present sulphathiazole should be tried.

Chronic impetigo Impetigo pityroides. In some cases the phlyctenules of the common type are followed by dry scaly patches Squamous areas are found about the upper lip and nose in children suffering from chronic nasal discharge and about the ear in chronic otorrhœa. They are probably as Adamson points out, streptococcal. Sabouraud regarded many of the dry scaly patches met with on the face and at the labial commissures in children, as of coccal origin, and Haxthausen has grown streptococci in profusion by using special methods of culture and describes the lesion as *streptococcic pityriasis Ariboflavinosis* may be an important etiological factor in obstinate cases and vitamin B therapy should be tried

The diagnosis of impetigo In most cases this is simple but it must be *remembered that many other conditions especially* itching eruptions, scabies eczema and prurigo may become impetiginised and the possible *existence of these diseases underlying the impetigo* must be considered *The occurrence of impetigo about the face, ears and neck* the acute onset, rapid asymmetrical spread, the contagious nature of the affection and the characteristic "stuck-on" scabs are of importance in diagnosis.

Bullous impetigo may be mistaken for pemphigus. True pemphigus is a grave disease and runs a chronic course with constitutional symptoms, wasting etc. In an early case advantage may be taken of the fact that *the fluid in the fresh bullæ of pemphigus is sterile,* and a bacteriological examination would be of great assistance. The eruptions of herpes and zoster are sometimes mistaken for impetigo but their unilateral distribution *is characteristic. Midge and gnat bites on the legs* are often bullous and may suggest a diagnosis of impetigo.

Some of the chronic varieties suggest eczema, while the lesions in the flexures are *often called intertrigo* The possibility of such conditions being due to coccal infection must be borne in mind and appropriate treatment applied.

The papulo-pustular and frambœsiform syphilides may be mistaken for impetigo particularly since they affect the face and head. Infiltration

underlying the scabs, other signs of syphilis and a positive Wassermann reaction will decide the diagnosis.

Prognosis. The prognosis of impetigo is good, resolution under appropriate treatment taking place in four or five days to three weeks unless there is infection of the hair follicles. Only in pemphigus neonatorum is there grave danger and the mortality in some epidemics has been 30 per cent.

Treatment. The treatment of impetigo is remarkably successful even in the most extensive cases. Penicillin in a powder lotion or cream is probably the most efficient therapeutic agent, 300–500 units per c.c. in a spray is often effective.

In our view sulphonamide therapy is not necessary in the average, simple case of impetigo but if employed we believe that it is better administered by mouth than as a local application and suggest sulphanilamide 0.5 gm. t.d.s. for seven days.

Some dermatologists employ a cream of 5 per cent. of sulphathiazole in an emulsified base with success, but should sensitisation arise from local applications of a sulphonamide it produces very much more prolonged distress to the patient than sensitisation from internal administration which is rarer.

The old-fashioned treatment by antiseptic *ointments* is not very helpful since the ointment, unless it contains an emulsifying base, merely rides on the exudate and does not reach the infected surface of the skin. A paste is preferable, and the following modified Lassar's paste needs merely to be plastered over the infected site and left in place :—

℞ Hydrarg. Ammon.
Acid. Salicyl. aa gr. 10
Amylum.
Zinc Oxide aa gr. 120
Paraff. Moll. ad oz. 1.
Ft. Pasta.

No preliminary removal of crusts is necessary since, by virtue of the salicylic acid, they are absorbed into the paste which also absorbs the infected fluid discharged and remains on the raw surface of the skin. It is not desirable frequently to remove the paste but merely to apply fresh paste when necessary. The simplicity of the treatment is a great advantage.

Where a paste cannot be applied—as on the scalp or beard area—an antiseptic lotion followed by powder or a calamine lotion is preferable. Lotio hydrarg. perchlor. 1/1,000 or Eau d'Alibour are suitable—the latter an, if necessary, be diluted to half strength :—

℞ Zinci Sulph., gr. 6.	1.5
Cupri Sulph., gr. 4	1
Aq. Camph., ad oz. 1.	100-
Ft. Lot.	

Humford has recommended incorporating hydrag. ammoniat. 2 per cent. in an emulsifying base as Halden's emulsifying base (Halden, Manchester) which allows the antiseptic in the base to mix with the infected

The eruption consists of vesicles which dry up to form crusts of a dirty brown colour differing in this respect from the yellow scabs of impetigo. *Around the crust a ring of small vesicles appears*, and when the scab is removed a shallow slightly cupped ulcer is found (Fig 256) There may be grave general symptoms and in all cases the lesions are more difficult to heal than those of common impetigo They leave permanent scars, and sometimes infiltrated nodules which may last a long time Secondary warty growths occurred among soldiers in France (1914–18) (MacCormac). The vacciniform and varicelliform ecthymatous eruptions are dealt with elsewhere being probably due to mixed infection (p 451)

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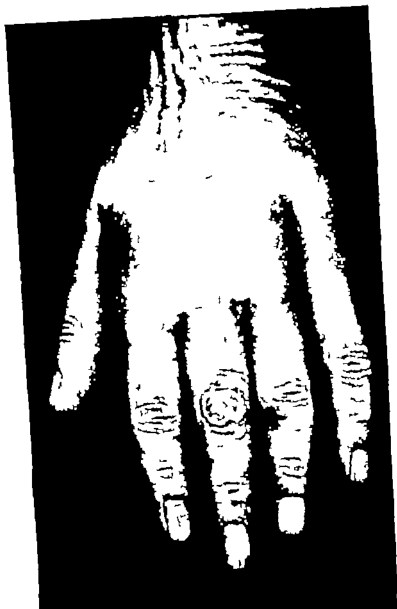
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The papulo-pustular and frambœsiform syphilides may be mistaken for impetigo particularly since they affect the face and head. *Infiltration*

PLATE 44



[illegible]

[To face p. [illegible]]

enlargement and coalescence of adjoining lesions lead to the formation of ulcers with circinate margins. Deep scars are left. The eruption is scattered over the lower part of the body and thighs and sometimes attacks the scalp and neck. In some cases it is widely disseminated. Abscesses frequently complicate the skin affection.

The general symptoms are high fever, grave exhaustion, wasting, diarrhœa, and convulsions.

About half the patients affected die from septicæmia.

Treatment. Local treatment is of the highest importance. The child should have frequent baths containing boric acid, or boric acid fomentations should be applied to the affected parts. Penicillin systemically and locally, or a sulphonamide by mouth merit first place in treatment, but we have seen cases complicating infantile eczema resistant to these drugs. The organism was a hæmolytic staphylococcus aureus, penicillin sensitive, but the condition finally responded to applications of 1/1 000 solution of proflavine and exposure to the air. Perchloride of mercury lotion 1/2,000 is also valuable. The general condition requires attention and in hospital practice it is imperative to admit the child to the ward. General ultra violet light irradiation of the whole body may help if the apparatus can be brought to the patient.

Impetigo herpetiformis. Herpes pyæmicus. A rare inflammatory disease characterised by the formation of groups or rings of minute pustules. It occurs chiefly in the puerperium and is often fatal.

The patients are usually pregnant women, but very rarely a similar condition has been observed in men (Graham Chambers). The disease is undoubtedly a form of septicæmia or pyæmia. Its bacteriology has not yet been worked out.

Symptoms. There are grave general symptoms. The onset is attended with rigors and pyrexia which are repeated with each successive crop of the eruption. The progress of the disease is attended with typhoid symptoms and albuminuria; the patient is delirious, the tongue dry and brown, and diarrhœa and vomiting hasten the fatal issue.

The eruption consists of nummular red spots, with some swelling upon which miliary pustules appear, and by the gradual increase of the areas of erythema and pustulation large tracts of the skin become involved. The centres heal up, and fresh pustules form at the periphery, so that a ringed and festooned arrangement is produced. Very often there are crusts in the centre of the rings. The eruption may gradually become universal, but the front of the trunk, the thighs and the groins are the commonest sites. The mucous membranes may also be involved.

Noma. Cancrum oris. Gangrenous stomatitis. Noma is a rare affection generally seen in children under six and is often the sequel of an infective fever. The buccal cavity shows an irregular sloughing ulcer with a red indurated swelling on the cheek. The rapidly spreading gangrene is accompanied by an offensive odour. It is a grave condition. Many cases occurred in concentration and refugee camps. No specific organism has been isolated.

Treatment. The Sulphonamides may be applied locally, but the most dramatic results have followed intramuscular injections of penicillin (Grimshaw & Stent.) Good food and vitamin B are necessary and permanganate mouth washes are advised.

Pseudo-mycosis (Castellani). This variety of tropical ulcer shows lesions below the knee, usually unilateral, rounded and from a few millimetres to 3 inches in diameter. They spread slowly, are punched out, having a rolled rarely undermined edge and have a base of necrotic myxomatous tissue. They may persist for years. The prognosis is favourable and treatment with potassium permanganate lotion and ultra violet light is advised.

REFERENCE—J. F. HAMILTON, *Journ. Trop. Med. Hyg.* 1938, 41, 1. Photographs.

STAPHYLOCOCCAL INFECTIONS OF THE SKIN

Although they cause superficial impetiginous lesions the staphylococci have a special preference for the follicles.

The following conditions require consideration :—

(1) Follicular impetigo (Impetigo of Bockhart).
(2) Boils (Furunculi)
(3) Carbuncle.
(4) Sycosis barbæ (Folliculitis of the beard region)
(5) Dermatitis papillaris capillitii (Folliculitis of the scalp).

Follicular infection may complicate impetigo contagiosa and is a marked feature of acne vulgaris.

Pustular Folliculitis (Follicular Impetigo of Bockhart)

A staphylococcal infection of the skin characterised by pin head or millet seed sized suppurative lesions about the hair follicles. The term follicular impetigo of Bockhart is unfortunate, causing confusion with streptococcal infections; superficial pustular folliculitis is a more useful description.

Etiology Follicular impetigo may occur at any age, but is commonest in children. Itching eruptions, causing scratching such as scabies, local irritation from chemicals or the application of fomentations, irritant liniments, plasters and ointments and lack of cleanliness, are the commonest predisposing causes. The follicular type may also occur as a sequel to impetigo. Impetigo of the follicular type was rife among the troops on active service, and with secondary furunculosis was a serious cause of invalidism.

Pathology The staphylococcus pyogenes aureus is found in the lesions which are primarily small abscesses in the hair follicles. There is also perifollicular infiltration. The suppuration may be near the mouth of the follicle (ostiofolliculitis) or deep (Fig 238).

Clinical features. The lesions are pustules varying in size from a pin's head to a small pea. Each pustule is surrounded by a small red halo, and a hair projects from its centre The two points which distinguish this type of folliculitis from ordinary streptococcal impetigo are the presence of suppuration from the beginning and the central hair The pus gradually dries up into crusts, which fall off and may or may not leave a small scar at the mouth of the follicle.

The pustules are commonly multiple and sometimes profuse and may occur anywhere on hairy skin (Plate 45)

The prognosis is good, but the lesions may pass on to furuncles and in infants to subcutaneous abscesses.

Treatment. In debilitated subjects iron is indicated. Purgatives are also beneficial at the onset. Local treatment may follow the lines of that employed in impetigo or sessions of fomentations wrung out in 1/4 000 perchloride of mercury may be used, a sterile dry gauze dressing or zinc oxide dusting powder being used between sessions. Painting with malachite green or gentian violet is an effective treatment.



FOLLICULAR IMPETIGO OF BOCKHART (STAPHYLOCOCCAL)

The lesions are small abscesses centred by a hair and surrounded by a zone of erythema.

[To face p. 457

matory conditions of the skin predispose to secondary furunculosis. Itching affections are very liable to be complicated by boils and friction may determine their site—as on the buttocks of rowing men and about the neck and wrists from the rubbing of garments.

Infection may occasionally reach the patient through milk or other foodstuffs or from some other person with a focus of infection. Virulent staphylococci are often carried in the nose with or without clinical signs of their presence.

Pathology The *staphylococcus pyogenes aureus* is the cause of the boil. It is found in the pus, sometimes also with the *staphylococcus albus* and *citrus*. The effect of the infection is to produce an acute inflammation with thrombosis of the vessels and necrosis. There is an extensive infiltration of leucocytes in and about the follicle.

Clinical features. The boil starts as a painful red indurated spot, slightly raised above the level of the surrounding skin. The induration enlarges peripherally and the central part becomes raised to form a convex tumour At first the colour is purplish red, with a halo of brighter redness and the boil feels hard. Later the centre softens and becomes of a yellow colour the epidermis gives way and by a single irregular opening (rarely more) pus is discharged. The necrosed tissue is extruded in fragments or as a "core," a whitish slough. On the rupture of the boil and the removal of the slough the inflammation at once begins to subside and the swelling and redness gradually disappear though some induration may persist. The sloughed-out cavity heals up and a scar remains. The area may be discoloured for weeks or months after the lesion has quite healed.

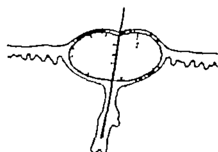
Occasionally the process is arrested before suppuration occurs, and resolution takes place without actual necrosis. This condition is commonly called "blind boil.

Furuncles are painful, extremely so when occurring in the external auditory meatus and the nostril, and there may be considerable constitutional disturbance until the pus escapes. The lymphatic glands are enlarged and tender and they may suppurate. Lymphangitis leading from the area of the boil is not uncommon.

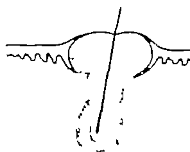
Boils occur singly or in crops coming out for several weeks or months. The name "furunculosis" is applied to the latter condition. Small satellites often appear around a boil, usually as the result of improper treatment by the prolonged ("four hourly) application of fomentations or poultices and the use of ointments or plasters, etc. Boils occur on any part of the body and limbs, but the neck, face, forearms, legs and buttocks are the commonest sites Small boils are also seen in the flexures, axillæ, gluteal cleft and upper part of the thigh and adjacent part of the scrotum. Here the lesions are always small and the infection is believed to begin in the large sweat glands in these regions.

The diagnosis is easy but extra-genital chancres and gummata may be diagnosed as boils. In the one case, however the lesions are those of acute inflammation—redness, heat, pain and swelling—in the other case they are chronic and symptomless.

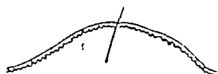
Prognosis. Localised furunculosis or a single boil rapidly yields to treatment Where there is tendency to recurrence much depends upon the possibility of removing the underlying cause. Boils on the upper lip



Ostiofolliculitis, Bockhart



Deep folliculitis, Sycosis barbae



Furunculosis (boil).



Pustular acne.



Carbuncle.



Sweat gland furuncle. Hidradenitis.

FIG 238. Diagram of types of staphylococcal follicular eruptions (after Darier).

℞ Mercury Perchlor ¼ per cent.
Brilliant Green, ½ per cent.
Industrial Spirit 90 per cent.
Ft Paint.

Penicillin and sulphonamide therapies have an important place as in the treatment of impetigo

Boil Furunculus

Boils are acute circumscribed follicular inflammations with necrosis and suppuration. They are often multiple

Etiology The state of seborrhœa or employment in oily occupations favours the development of boils. General and nervous debility septic foci about the upper respiratory passages anæmia diabetes and inflam

matory conditions of the skin predispose to secondary furunculosis. Itching affections are very liable to be complicated by boils and friction may determine their site—as on the buttocks of rowing men and about the neck and wrists from the rubbing of garments.

Infection may occasionally reach the patient through milk or other foodstuffs or from some other person with a focus of infection Virulent staphylococci are often carried in the nose with or without clinical signs of their presence.

Pathology The *staphylococcus pyogenes aureus* is the cause of the boil. It is found in the pus, sometimes also with the *staphylococcus albus* and *citreus*. The effect of the infection is to produce an acute inflammation with thrombosis of the vessels and necrosis. There is an extensive infiltration of leucocytes in and about the follicle.

Clinical features. The boil starts as a painful red indurated spot, slightly raised above the level of the surrounding skin. The induration enlarges peripherally and the central part becomes raised to form a convex tumour At first the colour is purplish red, with a halo of brighter redness and the boil feels hard. Later the centre softens and becomes of a yellow colour the epidermis gives way and by a single irregular opening (rarely more) pus is discharged. The necrosed tissue is extruded in fragments or as a "core," a whitish slough. On the rupture of the boil and the removal of the slough the inflammation at once begins to subside and the swelling and redness gradually disappear though some induration may persist. The sloughed-out cavity heals up and a scar remains. The area may be discoloured for weeks or months after the lesion has quite healed.

Occasionally the process is arrested before suppuration occurs, and resolution takes place without actual necrosis. This condition is commonly called "blind boil."

Furuncles are painful, extremely so when occurring in the external auditory meatus and the nostril, and there may be considerable constitutional disturbance until the pus escapes. The lymphatic glands are enlarged and tender and they may suppurate. Lymphangitis leading from the area of the boil is not uncommon.

Boils occur singly or in crops coming out for several weeks or months. The name "furunculosis" is applied to the latter condition. Small satellites often appear around a boil, usually as the result of improper treatment by the prolonged ("four hourly") application of fomentations or poultices and the use of ointments or plasters etc. Boils occur on any part of the body and limbs but the neck face, forearms, legs and buttocks are the commonest sites. Small boils are also seen in the flexures, axillæ gluteal clefts and upper part of the thigh and adjacent part of the scrotum. Here the lesions are always small and the infection is believed to begin in the large sweat glands in these regions.

The **diagnosis** is easy but extra-genital chancres and gummata may be diagnosed as boils. In the one case, however the lesions are those of acute inflammation—redness, heat, pain and swelling—in the other case they are chronic and symptomless.

Prognosis. Localised furunculosis or a single boil rapidly yields to treatment Where there is tendency to recurrence much depends upon the possibility of removing the underlying cause. Boils on the upper lip

or face may give rise to thrombosis which spreading to the cavernous sinus may be fatal. The incision or squeezing of such lesions is highly dangerous.

Treatment. Any underlying predisposing state must be corrected—especially glycosuria and any source of infection must be eradicated. In general iron appears to benefit most cases, but of the vast number of other measures recommended in the treatment of boils no one is of any certain value. Though the sulphonamide group of drugs has no dramatic influence as in streptococcal infections, we have often seen improvement follow the use of sulphapyridine (1 tablet four times daily for seven or ten days), or sulphathiazole, 1 grm. four hourly may be effective. Penicillin is the remedy of choice in severe cases and does not depress the patient like the sulphonamides. Injections of 100 000 to 500 000 units are advised.

Staphylococcal vaccine, toxoid and antivirus are of uncertain value. Many dermatologists use manganese or manganese butyrate by injection and brewer's yeast or vitamin B complex is helpful. The local is the more important aspect of treatment and conservative measures rather than surgical interference should be practised.

The site affected by boils should be painted with non-irritating antiseptics such as the dyes.

In the early stages an occlusive dressing as elastoplast or collodion should be applied. Later dry heat or compresses of carbolic in glycerin (one in eight) or sessions of hypertonic fomentations may be used. Fomentations should be wrung out in 1/4 000 perchloride of mercury and should not be left on the skin for four hours. A series of fomentations consisting of three or four in the course of one to one and a half hours once, twice or three times a day and intervening sterile gauze dressings are desirable to prevent the development of folliculitis round the boil.

If incision becomes necessary no more than a single puncture should be *made into the presenting pustule; no crucial incision* or scraping or squeezing or packing of the site should be allowed. The less interference the better.

Fractional doses of X rays (50–100 *r*) are of value in the treatment of furunculosis especially when localised on the nape of the neck or in the axillæ or perineum.

Disseminated furunculosis over the body is best dealt with by daily antiseptic baths (permanganate of potash), the use of a dusting powder containing 10 per cent. of calomel in zinc oxide and cotton undergarments which can be boiled and should be changed daily.

Any local treatment for boils should be continued for six weeks after healing since the pyogenic organisms abound on the skin for this time.

Tropical furunculosis is common and the affections are named after the locality in which they occur—Nile boil, Delhi boil, etc. (*vide* p. 603) but these are misnamed since they are not caused by staphylococci but are manifestations of cutaneous leishmaniasis. It should be noted that staphylococcal furunculosis is severely aggravated by tropical conditions.

Carbuncle

(Lat. *Carbunculus* small coal)

A carbuncle is an acute phlegmonous inflammation of the skin and subcutaneous tissue leading to necrosis.

Etiology The disease is more common after the fortieth year and males are more frequently affected than females. Diabetes is sometimes a predisposing cause, but other debilitating conditions may be complicated by carbuncle.

Of the healthy subjects who are carriers of the staphylococcus many suffer from recurrent carbuncles or boils.

Pathology Staphylococcal infection is the exciting cause The inflammation begins, as in a boil, around the hair follicles and numerous foci of suppuration are found in the connective tissue about them. The affected areas undergo necrosis as a result of staphylococcal necrotoxin, and this process becomes very extensive by the confluence of the separate areas of infection Ultimately large masses of slough form, and around them there is profuse suppuration. It appears probable that the arrangement of the connective tissue fibres in the region of the neck, running as they do vertically to the surface of the skin and producing numerous columns of fat, leads to the evacuation of the pus by a number of small orifices. The induration about the carbuncle is due to massive cellular infiltration around the central gangrenous mass.

Clinical features. The carbuncle begins as a flat infiltration, usually on the nape of the neck. The area is purplish red and very tense. It gradually spreads and may eventually be as large as the palm of the hand. After increasing steadily for a week or more, numerous small points on the skin give way and spots of grey slough become visible, and a sanious pus exudes from the orifices. Later the skin over the middle of the carbuncle necroses and comes away leaving an irregular crater-like ulcer which slowly heals by granulation. A permanent scar remains. The carbuncle is exceedingly painful and exquisite tenderness in the early stages is pathognomonic. There is often grave prostration in the aged or debilitated. Pyrexia is usual but moderate. Death may occur from septic absorption or from exhaustion or from venous thrombosis This latter is a particular risk with boils and carbuncles about the upper lip and face, especially after surgical operations.

Diagnosis. It is usually easy to diagnose a carbuncle from a boil The carbuncle is single its evolution is slower it is larger and flatter and there is brawny induration. The discharge of pus by cribriform openings instead of a single orifice is characteristic. There is also greater constitutional disturbance and severe depression is induced by the insistent quality of the pain and the profound toxaemia

The acute character of the lesion and the general disturbance distinguish it from kerion ringworm, gummata, iodide and bromide granulomata and actinomycosis.

The **prognosis** is good, except in the elderly and debilitated and in the subjects of diabetes and chronic alcoholism. Carbuncles on the face and scalp are more dangerous than those on the back and neck, as there is some liability to septic thrombosis of the venous sinuses.

Treatment. The general and local treatment of carbuncles should be the same as for boils except that the patient should be kept in bed. Some surgeons still advocate complete excision except for carbuncles about the face and in diabetics, but many are being converted to more conservative measures. We are quite certain that surgical interference should, if

or face may give rise to thrombosis which spreading to the cavernous sinus may be fatal The incision or squeezing of such lesions is highly dangerous.

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Light baths have proved of service and are worth trying in these cases

Chronic Pyogenic Ulcers

Chronic septic ulcers from which staphylococci and streptococci are cultured may arise and persist from any of the foregoing affections or may result from infection of a traumatic ulcer or bite. The ulcer has a purulent base and shelving edges or may develop hypertrophic granulation tissue which may be riddled with pus-containing channels. They may be excised or scraped and cauterised or may respond well to general sunlight therapy or to cod-liver oil locally (see Pyogenic granulomata, p 463)

Coccogenic or Simple Sycosis

(Gk. *sukosis*, fig like ulcer)

Boils and simple septic folliculitis may occur on the beard area or other hairy parts, but sycosis, which is also a *pustular folliculitis from which the*



FIG. 310. Coccogenic sycosis.

staphylococcus can be cultured, is probably a reaction dependent upon specific sensitisation to the staphylococcus and is therefore in the nature of a follicular eczema. An old case of cured sycosis *may react to staphylococcal toxins*—as from injection of staphylococcal vaccine—by a follicular

possible, be avoided. X ray therapy on the other hand, is most valuable and may be regarded as the treatment of election. A single dose of 150 r is adequate or 4 doses of 50 r spread over a week.

As a form of dry heat short wave *diathermy* and *infra red rays* are employed with success in the treatment of boils and carbuncles. Penicillin is usually a specific remedy and sulphathiazole 1–2 tablets t.i.d. for a week may be tried massive doses of the sulphonamides are too depressing in our experience A paste of mag sulph. anhydrous 24 parts glycerin 11 parts suggested by Morrison, is very popular as a local application for carbuncles Like the glycerin and carbolic mentioned for boils it acts by promoting a flow of fluid from the inflamed area but this osmotic effect cannot be exerted *while the skin surface is intact and it irritates some skins*

Multiple cutaneous and subcutaneous abscesses in infants. A staphylococcal infection characterised by the formation of multiple small abscesses in the subcutaneous tissue and deep parts of the skin.

Etiology The patients are young infants sometimes debilitated and



FIG 239 Multiple subcutaneous abscesses.

suffering from impetigo of the common or of the bullous variety or from impetiginised eruptions in the napkin area. In several cases under our observation the children have been in comparatively good health, but the disease may be associated with pneumonia and occasionally with tuberculosis The pus contains staphylococci, often obtainable in pure culture. It has been suggested that infection may occur through the milk of mothers suffering from mammary inflammation but the disease is not confined to nurslings. The condition would appear to be a chronic staphylococcal infection associated with organisms in the blood stream.

Clinical features The lesions are numerous intradermic and hypodermic nodules about the size of a pea or larger They are elastic and on incision *a creamy pus is evacuated. The general* condition is very variable, some of the infants being in a fairly healthy state without pyrexia, while others are gravely ill and have all the evidence of septicaemia.

The *prognosis* in the absence of grave septicaemia, *is generally* good.

Treatment. Any cutaneous impetigo requires treatment in the usual way The abscesses should be opened and fomentations or mild antiseptic

baths hasten their healing Penicillin or adequate doses of sulphathiazole should be given.

Light baths have proved of service and are worth trying in these cases.

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erythema of the beard area, demonstrating the specific sensitiveness of that tissue. *That is the main factor responsible for difficulty in treatment.* While sycosis may result from external infections as in impetigo boils and folliculitis it may arise as a sensitisation reaction from internal foci of staphylococcal infection especially *about the nose, mouth and throat* Cases of simple sycosis arising from external infection are relatively easy to treat and respond well except that fractional X ray therapy may be necessary to deal with the skin sensitisation. These however form the minority of cases the majority being associated with intranasal mouth or throat sepsis and occurring in seborrhoeics (see seborrhoeic sycosis, p. 206) thus giving rise to great difficulty in treatment

Pathology The essential feature is a suppurative inflammation in, and around the hair follicles The cause is the *staphylococcus pyogenes aureus* and *albus* Each hair follicle is converted into an abscess. In the variety called lupoid sycosis the lesions are granulomatous, but there is no evidence of tuberculosis either in the histology or the presence of bacilli

Clinical features The primary lesions are red follicular papules which rapidly become pustules. The spots may be limited to a small area, but as a rule they spread rapidly until the whole of the beard region, except the upper lip is involved Each pustule has a hair at its centre which at first is somewhat difficult to remove with the forceps and its removal is followed by a bead of pus. Scarring and permanent loss of the hair may be the result but are unusual Cheloid is a rare sequel The process tends to be *a chronic one and frequently cases are seen which have lasted for several* years.

Often the more active phase may subside to a chronic redness and scaliness with scattered small pustules lasting for years after the acute suppuration has cleared up

Lupoid sycosis is a special variety in which the disease slowly spreads with a raised infiltrated margin. In the wake of this edge the follicles gradually undergo cicatricial atrophy The disease is usually symmetrical. It is indistinguishable from common sycosis at its origin, and by some is believed to be always secondary to it. There is no reason to believe that it is a tuberculous process as the name sycosis lupoides would imply *It* is extremely refractory to treatment

Diagnosis. It is important to bear in mind that some forms of ring worm of the beard region are also pustular *The lesions* are localised, tend to be very boggy suggesting abscesses or boils but are not acute and painful. These features should excite suspicion, which will be turned into certainty *by an examination of the hairs under the microscope* Removal of a hair from a ringworm infected follicle is easier than in the case of sycosis.

The papulo-pustular eruption of rosacea may resemble sycosis but the flushed face and presence of lesions on nose, forehead and cheeks will suggest the correct diagnosis In adolescents an admixture of acne and sycosis may exist and cause confusion.

Impetigo contagiosa differs from sycosis in not being confined to the hair follicles, and phlyctenules are often present away from the *beard* region but, as already mentioned, sycosis may follow impetigo Eczema also is not usually confined to the beard area. The lesions are not specially follicular but there may be *some difficulty in diagnosis* where there is

secondary pus infection on an eczema of the chin. Ingrowing hairs cause inflammatory follicular papules resembling sycosis. The condition is often hereditary the pustules are more superficial and contain imprisoned hairs. Syphilis sometimes simulates sycosis. This imitation most commonly occurs in the tertiary stage, but lesions are suspiciously crenate and the removal of the crusts on the surface may disclose punched-out ulcers, and a complete examination of the patient will usually reveal other signs of syphilis. The tongue and throat must not be forgotten as throwing valuable light on an obscure case, and the Wassermann test should be done

Lupus vulgaris and lupus erythematosus might possibly be mistaken for lupoid sycosis. The history of the disease starting with the formation of pustules about the hairs would be a help in the diagnosis. The most important differential diagnosis, however is from seborrhoeic eczema and sycosis (see p 206). Here involvement of the upper lip, blepharitis, affection of eyebrows and other sites will generally indicate the true diagnosis

Prognosis. Simple coccogenic sycosis is not as difficult to cure as the seborrhoeic type but recurrences may occur

Treatment. In all cases of sycosis it is important to deal with any sepsis in the mouth or nose and with any general state of debility

Fractional doses of X-rays (50–150 r) are usually most valuable and certain particular antiseptic measures have proved effective. The first is eau d'Alibour used in full or half strength —

℞ Zinci Sulphatis, gr vi.
Cupri Sulphatis, gr iv
Aq Camph., ad oz. i.
Ft. Lot.

A second useful application is malachite green which may have to be alternated occasionally with fomentations :—

℞ Hydrarg Perchlor., ½ per cent.
Brilliant Green, ½ per cent.
Industrial Spirit, 99 per cent.
Ft. Pigmentum.

Penicillin cream and spray have given excellent results.

A proprietary application of considerable value is ung quinolor co. (Squibb).

Generally ointments are better avoided though the new emulsifying bases may be more valuable. If possible daily shaving is desirable the trauma to the skin being less than with intermittent shaving

X-ray epilation of the beard area is sometimes undertaken but is undesirable and rarely necessary The epilation dose often aggravates the infection and devitalises the skin but local penicillin therapy may succeed after epilation. Manual epilation is often helpful.

Barber has had some success with vaccine therapy

Dermatitis vegetans. *Pyodermite végétante, Hallopeau.* This disease is to be regarded as a vegetating pyogenic dermatitis It often begins as a collection of small pustules on a very inflamed base, and by aggregation a

larger scabbed area is formed Subsequently an infiltrated plaque of minute papillary granulations develops to form a verrucose or "plush velvet" type of surface The lesions are most common about the flexures of the axillæ groins angles of the mouth but affect other parts of the face scalp and limbs Pemphigus vegetans may be a related condition

No specific organisms apart from the pus-cocci appear to be involved, though it is thought that some lesions are mycotic and cases occur which resemble blastomycosis. The lesions generally resist the usual antiseptic preparations and a preliminary painting with liquid phenol and a few doses



FIG 241 Sycosis nuchæ Secondary sepsis causing bogging of tissues. (Reproduced by permission of the late Dr R. C. Smith.)

of X rays are of great value. Penicillin or the sulphonamides may be effective but it is not established that the lesions are due to pus-cocci

Dermatitis repens (Crocker) An inflammation starting usually from an injury and spreading by the formation of vesicles and pustules which erode the epidermis The injury may be quite insignificant but vesicles form at its side and rupture The epidermis is thrown off leaving a raw red or glazed surface From the margin the lesion spreads slowly by the formation of fresh vesicles under the epidermis Sometimes the vesicular lesions are of large size As a rule the hand is affected, but the disease has been known to spread up the limb to the trunk and down the opposite arm Dermatitis repens is of slow development and may last for several weeks or many months Radcliffe Crocker considered the condition as a neuritis primarily with secondary coccal infection and staphylococci can generally be cultured.

Treatment Penicillin or a sulphonamide may cure the condition. The

undermined epidermis may be cut away and a 10 per cent. lotion of potass. permanganate applied. The affection is very resistant to treatment and runs a prolonged course though most cases eventually heal with or without scarring. Ingram has found ung. dithranol occasionally effective.

Malachite green and cod-liver oil are useful applications and X-ray therapy may be tried.

Sycosis nuchae. Dermatitis papillaris capillitii. Acne cheloid (Lat. *nucha*, spinal cord; *capillus* hair). This is a rare disease characterised by inflammation of the hair follicles of the nape and adjacent part of the scalp.

Pathology. The lesions are peri-follicular with deep indurations. It is more nearly related to sycosis than to acne. *Staphylococcus pyogenes aureus* and *albus* are found.

Clinical features. A number of small closely-placed papules appear in the occipital region. They may develop rapidly into vascular vegetations composed of granulation tissue. Crusts form and a foetid secretion exudes. The process is very chronic, and after a duration of years the inflamed area undergoes a sclerotic change with irregular thickening and the development of retention cysts. The cheloidal stage may arise without the preliminary suppuration. Between the cheloidal bands thus formed tufts of hair are usually present. The disease is common in native races.

Treatment. The X-rays offer by far the best means at our disposal, both in the inflammatory and the cheloidal stages. X-ray dosage should be in the region of 400 *r* units filtered by 1 mm. aluminium and may be repeated once or twice at intervals of six months. Response is not always good and sometimes complete excision of the affected area with or without skin grafting may be necessary.

Pyogenic granulomata. Sometimes in pyogenic infections granulomatous lesions give rise to diagnostic difficulty.

Three types of lesion may be recognised:—

(1) A chronic indolent ulcer of ecthymatous pattern with shelving margins, a granular base and a sero-purulent discharge. It is more common in children but may occur in debilitated adults.

(2) A papular or nodular lesion, very vascular and deep red in colour usually arising at the site of an abrasion or pustule. It begins as a red minute papule and becomes elevated during the course of weeks or months to form a sessile or pedunculated tumour. The surface usually remains moist and bleeds readily in the more rapidly growing lesions which appear to be set in cup-like depressions of the skin. On the other hand, the more sluggish lesions are often covered by a thin layer of epithelium and the surface is dry, smooth and shiny so that the larger nodules closely resemble a red cherry. The structure is so vascular that the histological picture is that of an angioma. The name "granuloma telangiectaticum" has been applied.

The term "botryomycosis" is used in veterinary surgery for a fungating granuloma met with in horses after castration. It occurs in the testicular cord and in the neighbourhood of the scrotum, and may become generalised. Similar lesions termed "orf" occur about the face of sheep and lambs and appear to be related to foot rot in sheep. It is due to a filterable virus and the infection can be acquired by persons in contact

with infected animals (see p 615) A similar condition is occasionally met with in man as a sequel to wounds without any such contact with infected animals etc. It is therefore commonest on the uncovered parts.

Their importance lies in the possibility of mistaking them for malignant neoplasms Removal by curette and light cauterisation with phenol liq or galvano-cautery is not usually followed by return *in situ* and sections show the inflammatory character of the tumours

(3) A third type closely resembles the granulomatous fungating lesions of tuberculosis syphilis and yaws The lesions consist either of discrete *papillomatous masses from the interstices of which pus may be expressed* or of confluent vegetating areas resembling dermatitis vegetans (p 461).

Granuloma telangiectodes tropicum (von Bassowitz) Angio-fibroma cutis circumscriptum contagiosum. This affection which appears to be closely allied to human botryomycosis was described by von Bassowitz, who found it among the natives of Santa Victoria de Palma in Southern Brazil

The infection is believed to take place through the mouth, the natives being in the habit of handing from one to another their pipes and also drinking vessels containing mâte The period of incubation is fifteen to twenty five days.

The onset of the disease is quite acute an eruption of bright red papules appearing on the face, neck axilla or pubic region, and occasionally elsewhere. The papules rapidly develop into large, red, shining tumours, which are highly vascular and on slight injury give rise *to severe and* frequent hæmorrhages which may lead to grave anæmia The tumours are painless and do not itch. There is no fever or interference with the general health. The glands are unaffected. The condition lasts about a year and the prognosis is altogether favourable. Von Bassowitz's *account* suggests a similarity to the appearance of the florid tumour about the mouth which was present in Sequeira's case of granuloma inguinale tropicum (*vide infra*) The disease is distinguished from yaws by the absence of joint pains.

Microscopically the tumours consist of granulomatous tissue with dilated lymph spaces and vessels developing from the vessels of the cutis.

Treatment The tumours are removed after being injected with formaldehyde Should they ulcerate they are treated with oxide of zinc and salicylic acid ointment. The X rays have been found to be useful and intravenous injection of antimony as for dermal leishmaniasis *has* proved remarkably successful.

Ulcers of the vulva. Ulcers of the vulva may occur as elsewhere from infection with the various pathogenic bacteria now under consideration but the rareness of vulval ulcers indicates a high degree of *local resistance* Apart from boils which are not uncommon, and venereal ulcers, described elsewhere infections of the vulva are usually due to tuberculosis, to the diphtheria bacillus and possibly to diphtheroids and rarer still to actinomycosis. Ulcerative lesions may occur with herpes and zoster

More difficult are the recurrent ulcers of the vulva, for *it is rarely* possible in such cases to identify a causative pathogenic organism and in ulcus vulvæ acutum which Lipschütz considered was due to the bacillus crassus the etiology is still regarded as unproven

Hunt suggests the following classification of recurrent ulcers :—

Recurrent ulcers of Muco-cutaneous surfaces

(*a*) Aphthous ulcers, not herpetic.
(*b*) Periadenitis mucosa necrotica recurrens. (Sutton.)
(*c*) Erythema multiforme.
(*d*) Ulcus neuroticum, probably not a clinical entity
(*e*) Ulcus vulvæ acutum. (Lipschütz.)
(*f*) Lichen planus bullosum.

Periadenitis mucosa necrotica recurrens (Sutton) is also called "Recurrent ulcerating nodules" because the initial lesion is a deep nodule beneath the mucous membrane which necroses to form a deep ulcer of the buccal or vaginal mucosa or of both. The cause is unknown, the inguinal glands are swollen and tender slight pyrexia but little constitutional disturbance is the rule, and the healing is slow and little affected by any treatment.

Ulcus vulvæ acutum. This affection occurs in girls and young women and the infection is not conveyed in coitus. The causative organism was thought to be the *Bacillus crassus* (Lipschütz). The ulcers are acute and painful and may become gangrenous. Pyrexia and general prostration accompany the local disease. Occasionally destructive ulcers occur in the mouth. In some cases there is a general papulo-erythematous or pustular eruption which may pass on to fine desquamation. The bacillus crassus is usually present in almost pure culture in the exudate. Acute vulval ulcer may be mistaken for a venereal infection. Examination for the bacillus and the treponema or Ducrey organism may be required to settle the diagnosis. The disease always runs a benign course and clears up with rest and the application of weak antiseptics. Relapses sometimes occur

In our experience recurrent vulval ulcers are very rare and our bacteriological findings have not aided therapy Penicillin and the sulphonamides have been ineffective in our cases. Severe scarring and deformity may result

REFERENCE.—E. HUNT 1948 "Diseases affecting the Vulva" (Kimpton).

DIPHTHERIA OF THE SKIN

The bacillus of Lœffler sometimes attacks pre-existing wounds, burns or sores, and the characters of the lesions thus produced have been recognised for a long time. The ulcer or wound becomes covered with a characteristic white adherent membrane. The general symptoms may be severe, and paralyses have sometimes followed. Cases in which a form of whitlow has developed are sometimes met with, but occasionally there is a generalised impetiginous and ecthymatous eruption. The latter cases are nearly always taken for a coccogenic infection as there is no diphtheritic membrane The diagnosis has been made by cultivations from the lesions. In all the recorded cases both the *corynebacterium diphtheriæ* and staphylococci have been present. In other cases of a herpetic or bullous type the bacillus of Loeffler has also been found and occasionally diphtheroid bacilli of doubtful pathogenicity have been the only organisms recovered from lesions having diphtheritic features. Antitoxin is as valuable in treatment of diphtheria of the skin as in the affection of the mucous membranes, and should be given without delay and gauze soaked in antitoxic serum is a useful dressing. (*See* Desert Sore below)

Veldt Sore Desert Sore (Natal Sore) Barkoo Rot

This name is given to a form of pustular eruption and ulceration closely resembling ecthyma It was very common among the British troops and Boers during the South African war and is familiar to travellers on the veldt It is common in Queensland and the Northern Territory of Australia

During the war of 1914–18 and again during the campaigns in North Africa and the Near East desert sore was the cause of much suffering in the troops

There seems to be no doubt that at least two conditions have received the name of veldt or desert sore One is a form of cutaneous diphtheria and in the other the etiology is at present obscure



Fig 212 Veldt Sore Mesopotamian case 2½ years duration Healed in ten days with 4 000 units of anti-diphtheritic serum. (Plate kindly lent by Dr Manson Bahr)

In 1916 Craig found the *Corynebacterium diphtheriæ* in 97 5 per cent. of his cases of desert sore in the Sinai Peninsula

An outbreak among troops on the North West frontier of India was followed by paresis in about 10 per cent. of the patients (Bensted) Cameron and Muir reported an epidemic of diphtheria in Northern Palestine in which there were nearly as many skin infections as faucial and nasal cases Paralysis developed in 1° of 66 cases Cutaneous diphtheria is common in some parts of China

On the other hand Rapport in Libya had only two positive swabs in 1 000 cases of desert sore He found that individuals normally living in temperate climates were very susceptible " Desert sore was almost universal among the troops particularly attacking newcomers Egyptian and Libyan natives however did not escape It was thought that one factor in this widespread distribution was the difficulty in maintaining an adequate supply of essential foods and vitamins Flies tended to spread the disease and irritation by sand aggravated it.

Clinical features. *Acute cases* Cameron and Muir described acute cases which were always associated with nasal or faucial diphtheria The lesions appeared on unbroken skin or the sites of old trauma The radial aspect of the forearm and back of the hand were most often affected suggesting direct inoculation from nose or throat The lesions began as small blisters or pustules about a hair follicle On rupture there appeared a flat shallow sore which yielded rapidly to treatment by antitoxin The Klebs Loeffler organism was easily found in the fluid.

The *common type* of veldt or desert sore tends to run a chronic course

The lesions may appear on insect bites or wounds. They are very often multiple. They occur most often on hairy exposed parts, particularly the dorsum of the hand, the forearm, elbow and knee. Occasionally the eyebrows and cheeks are affected. The initial lesion is not often seen in hospital practice. It begins about a hair follicle as a painful vesicle which soon becomes pustular. On this rupturing an ulcer circular or oval in shape with a punched-out appearance is found. The edges, judging from Cameron and Muir's description of the diphtheria cases are thickened and rolled. In the more common type we have found thin, undermined edges. When first seen the sore is usually covered with a dark brownish scab under which there are unhealthy-looking granulations. The ulcers slowly spread along the undermined tracks. At first the lesions are very painful, but at this stage they are indolent and painless. One disappointing feature is common and that is that an ulcer which seems to promise resolution, is found on lifting the scab still to present a suppurating surface. Healing may take place in a week or be postponed for several months. Manson-Bahr reported a case of two years duration. A permanent purplish-blue papery scar is left.

Treatment. In all cases a liberal diet, rich in proteins and vitamins is indicated. In the diphtheritic cases an injection of 20 000 units of antitoxin should be given. Manson Bahr recommends that in all cases of chronic desert sore it would be wise to give 4 000 units with a view to preventing paralysis. The sulphonamides and penicillin are useful in the non-diphtheritic cases only.

A characteristic of "desert sore" is its slowness to heal outside hospital and its rapid response to treatment in hospital. It was found in the Libyan campaign that soldiers should be removed from the field, and that a few days at the base often cured the condition. Rapport found great benefit from ascorbic acid, but it would probably be wise in all cases to give combined vitamins. Local treatment is of importance. After cleansing, dressing the ulcers with sulphapyridine 1·5 gram in 2 ox. soft paraffin, or dusting with powdered sulphapyridine was found of value in North Africa. Cameron and Muir found saturated solutions of magnesium or sodium sulphates in glycerin effective and we can endorse their recommendation. Eusol, acriflavine and the dye preparations are also of service. Small early ulcers often heal with a solution of silver nitrate (10 per cent.) applied with a camel hair brush. We think the phenol camphor preparation used with success in the Sudan is somewhat dangerous and demands great care as the application must be kept quite dry.

REFERENCES—C. M. CRAIG. *Lancet*, 1919, 2, 478. J. D. S. CAMERON and E. G. MUIR. *Ibid.*, 1942, 2, 720. H. J. BENSTED. *Journ. R.A.M.C.*, 1936, 67, 283. H. M. RAPPORT. *Brit. Med. Journ.*, 1942, 2, 96.

Anthrax (Malignant Pustule)

(Lat. fr. Gk. *anthrax* coal)

A specific disease with peculiar necrotic lesions due to the anthrax bacillus.

Etiology. Infection usually occurs from the hides, and occasionally from the bodies, of animals which have died from splenic fever. Workers

in tanneries, wool-sorters and butchers are consequently the most frequent victims. Carrying infected skins on the shoulders is the cause of the face and neck being so often the site of inoculation. Anthrax is common in Africa among natives who habitually eat the flesh of diseased animals, particularly goats. Gold reported 60 cases, most of which occurred in a mill where Chinese and Indian goat hair was being used. The organism is in all probability introduced through a wound or abrasions while skinning the animal. A number of infections through shaving brushes have been reported, the bacillus having been isolated in numerous instances. The shaving brushes were of cheap manufacture, imported from the East, the hairs used being those of the pony. The *bacillus anthracis* is found in the vesicles and later in the blood and organs.

Clinical features. The primary lesion appears one to three days after infection on an exposed part, usually the face, neck, or hand. It is a papule and usually single. The papule soon becomes a vesicle or small



FIG. 243. Anthrax.

bulla, containing blood at first, and later pus. The infected area rapidly becomes gangrenous and a black slough forms, around which a ring of tense vesicles develops. There is a very notable œdema of the surrounding skin over a considerable area, and the patient complains of intense pain. Secondary lesions from auto-inoculation occur, but are very rare. The temperature rises to 104° to 105° with pains in the limbs and vomiting. Prostration supervenes early and the patient passes into a typhoid condition. In severe cases death occurs in two or three days, but occasionally mild cases are seen in which the constitutional symptoms are slight (Plate 46).

Diagnosis. The special features are the gangrenous spot with a ring of vesicles around it, and the infiltration and œdema beyond this.

The nature of the patient's employment will be of assistance in making a diagnosis, which is rendered absolute by the finding of the *bacillus anthracis* in the fluid from the vesicles.

Prognosis. The mortality used to be about 35 per cent. but it is now

PLATE 46

under 6 per cent. In some races the infection runs a mild course. This is particularly the case in the natives of East and Central Africa.

Treatment. Penicillin is at present on trial in the treatment of anthrax. Immediate intravenous injection of 3 c.c. of Sclavo's or Mumford's serum to be repeated daily usually in smaller dosage, is the appropriate treatment. The administration of N.A.B intravenously is also a valuable measure. Hodgson had 41 cases without a death. He combined serum and arseno-therapy. Gold found sulphapyridine a valuable adjunct to Sclavo's serum. Complete rest and general tonic therapy are indicated.

Locally fomentations relieve the symptoms. Great care must be taken by those attending the patient to avoid getting infected.

References—A. E. Hodgson. *Lancet*, 1911 1, 811. H. Gold. *Archiv. Int. Med.*, 1942, 70, 785.

Equinia (Glanders. Farcy)

(Fr. *farcin*)

A contagious disease, rare in the human subject, due to the *bacillus mallei*, and characterised by cutaneous lesions and constitutional disturbance.

Etiology. The patients are men who come in contact with horses in the course of their work. The organism is the *bacillus mallei*.

Clinical features. After *local* inoculation of the skin with the microbe, a papule or pustule appears. It rapidly breaks down into an irregular ulcer with undermined edges. The ulcer spreads and the lymphatic vessels and glands in the neighbourhood become acutely inflamed.

Generalised equinia is characterised by the formation of small cutaneous and subcutaneous swellings which break down. These are the so-called "farcy buds." The mucous membrane of the respiratory tract becomes affected, and particularly the nasal cavity in which extensive ulceration with foul discharge and crusts develops. Accompanying these cutaneous manifestations there is grave prostration with high fever and articular pains. Acute cases usually end fatally, the patient dying in a typhoid condition but chronic cases occur in which recovery may take place after the lapse of some months.

Prognosis. Nearly all patients affected with acute equinia die. One-half of those with the chronic affection recover.

Treatment. Immediate removal of the inoculated lesions by the knife or curette offers the only chance of saving the patient in the acute type. Injections of mallein, $\frac{1}{10}$ c.c., should be tried. In the chronic cases some favourable results from injection have been reported. The general treatment is on the lines of pyaemia.

Reference—F. Klein. *Brit. Med. Journ.*, 1907 2, 983.

Verruga peruana (Lat. *verruca*, wart). Verruga peruana is the localised manifestation of Oroya fever (Carrion's disease). It is endemic on the western slopes of the Andes in Peru, Ecuador, Bolivia and Chile. In some valleys nearly every inhabitant is affected.

Pathology and etiology. The causative organism is the *Bartonella bacilliformis* and the vector is believed to be *Phlebotomus noguchi*. Cole

has been able to transmit the disease to apes Rabbits and dogs may also be infected by intratesticular and intraperitoneal injections. Carrion, a Peruvian student, inoculated himself with verruga peruana and shortly after died from Oroya fever The lesions are of the granulomatous type composed of mono- and polymorpho nuclear leucocytes and connective tissue cells and is very vascular

Clinical features In its clinical appearances verruga peruana shows features which simulate yaws After inoculation there is a period of incubation which varies from eight days to six weeks The early symptoms are pyrexia pains in the joints and anæmia The eruption appears from three weeks to six months after the onset of the illness. It first affects the face and the extremities, and then spreads to other parts, including the mucous membrane of the mouth, œsophagus stomach and bowel and also the bladder vagina and uterus. The cutaneous lesions are red macules or vesicles which itch. At a later date warty growths develop upon the sites of the macules They may be small and numerous or form large discrete sessile or pedunculated tumours. Hæmorrhage from the nodular lesions is common As the disease subsides the growths become dry and horny and rupial syphilis or psoriasis is sometimes confused with Peruvian warts on this account.

Although there may be some danger from hæmorrhage verruga peruana is not a fatal disease. In some cases however Oroya fever which is very dangerous to life, may co-exist with a local Bartonellosis

Treatment The arsphenamines given intravenously are of service Large ulcerating tumours should be excised and smaller ones cauterised with phenol or galvano-cautery The patient, if possible, should be removed from the infected district.

REFERENCES—H N Cole *Archives of Internal Medicine* December 15, 1912, p 668. W Kikuth "The Bartonella and Related Parasites in Man and Animals." *Proc Roy Soc Med.* (Tropical Dis section), 1931 p 57

Tularæmia Tularæmia is a specific infectious disease of rodents caused by the *Bacterium tularense* and conveyed to man by direct contact with infected rodents or by vectors It has several synonyms Deer fly fever Ohara's disease Pahvant Valley plague etc

Occurring mainly in rural populations it is found in the United States, Japan Siberia and the Volga Delta Wild rabbits are the common source of infection Their uncooked flesh may carry the disease but the wood tick *Chrysops discalis* has been shown to be a vector

The *B tularense* is Gram negative non motile and non sporing It is only 0 2 μ to 0·7μ in length and occurs in coccoid and bacillary forms. Special media are required for its cultivation and the cultures are highly infectious

The period of incubation is from one to ten days. The onset of the disease is sudden with high fever headaches giddiness pains in the limbs and back and intense weariness The pyrexia may last for three weeks, but there is commonly a short remission from one to three days after the initial rise of temperature

The site of inoculation shows an inflammatory reaction which rapidly becomes papular This lesion undergoes central necrosis and a slough is

extruded leaving an ulcer about 10 mm. in diameter Healing is slow and a scar is left.

The primary lesion occurs most frequently on the fingers, the toes the jaw cheek or eyelid. The genitals are very rarely attacked. Histologically the lesion is a granuloma. The nearest lymphatic glands are inflamed and the skin over them is red. Suppuration may occur An interesting feature is formation of subcutaneous nodules (10 mm. across) along the course of the lymphatics. Such swellings may be single but there are often three along the limb. They may subside spontaneously or rupture

In addition to the local affection of the skin an erythematous, papular or nodular eruption may develop in the first six weeks of the illness. This rash affects chiefly the upper part of the trunk and upper limbs and is usually more evident on the side on which the primary infection took place

The mortality from tularæmia is about 4 per cent. It should be treated like any other form of febrile illness. Benefit is said to have followed the administration of a specific serum (Foshay). As soon as the temperature falls, good feeding is essential and the patient should be confined to bed for some weeks. Convalescence is slow and these measures will prevent relapses.

REFERENCES.—AMOS and SPRUNT *Jour Amer Med. Assoc.* 1936, 106, 1078 (Review of literature). F MUSSELMANN, *Presse d. Hyg. M* 1933 57 861 J M. HITCH and D C. SMITH. *Archiv. Derm. and Syph.* (Chicago), 1936 33, 830 (Figures). FOSHAY's serum. *Lancet*, 1937 1, 717

Erythema brucellosis is the name given to eruptions occurring in veterinarians and others who deal with cows suffering from contagious abortion. The rash may be of two types and appears chiefly on the arms after the removal of an infected placenta One form of the rash consists of patchy or diffuse areas of a light red colour which disappear in a few hours In the other form the lesions are small reddish papules which may last for three or four days. In some instances the papules become pustular and even necrotic In susceptible subjects the reaction may recur every time there is exposure to infection. Extracts of *Brucella abortus* rubbed into the skin of such individuals may produce the eruption.

Undulant Fever (Malta Fever Mediterranean Fever Gibraltar Fever Rock Fever etc.) is an endemic or epidemic infection with *Brucella melitensis* *B paramelitensis* or *B abortus* characterised by prolonged relapsing fever mild and transitory erythema or purpura, splenomegaly arthralgia, neuralgia and secondary anæmia.

CHAPTER XXII

CHRONIC BACTERIAL INFECTIONS OF THE SKIN

Tuberculosis—Tuberculides—Sarcoidosis.

Tuberculosis of the Skin

Koch's bacillus is the cause directly or indirectly of a number of cutaneous affections. In some the organism is found in the affected areas in greater or less number, inoculation of portions of the morbid tissue produces tuberculosis in the guinea pig and a local reaction follows the injection of Koch's old tuberculin. The diseases in which these conditions obtain are classed as tuberculous diseases of the skin. They generally occur in young subjects and are characterised by chronic granulomatous infiltrations of the skin. But there are other affections in which the clinical history, the histological appearances and the association of tuberculosis elsewhere strongly suggests a tuberculous origin, but the tubercle bacillus is *very rarely found in the lesions, and positive results* from inoculation are exceptional. To these conditions the name "tuberculides" has been given by Darier. It was supposed that they were due either to the circulation of toxins of tuberculous origin or to attenuated forms of Koch's bacillus. It is now thought that some are allergic phenomena, that others represent various stages of specific sensitivity, while a third group may be dependent upon an altered state (perhaps a filterable stage in the life cycle) of the organism (*vide* p. 510). The tuberculides are usually symmetrical in their distribution.

The tubercle bacillus may reach the skin (1) by the blood stream, as in *miliary tuberculosis and some forms of lupus vulgaris*; (2) by auto-inoculation from open tuberculous lesions in the lung, bowel or genito-urinary tract, as in acute tuberculous ulcer; (3) by direct introduction of the microbe through breaches of the surface, as in tuberculosis verrucosa, and occasionally in lupus vulgaris; (4) by extension from the mucous membranes, by lymphatics, *e.g.*, from the nasal cavity in lupus vulgaris; (5) by infection from broken down tuberculous glands and sinuses extending from foci in the bones and joints, as in *scrofuloderma and lupus vulgaris*.

Clinical tests for tuberculosis. The injection of Koch's old tuberculin, the Mantoux, von Pirquet's and Calmette's tests, the patch test, and Moro's ointment may be used. It must, however, be remembered that particularly in an urban population a very high percentage of adults have at some time suffered from infection by the tubercle bacillus. The nature of such infections may have been unrecognised, but the patients may give a positive tuberculin reaction. The clinical tests therefore are *of little* practical value except when positive in young subjects or negative in adults.

The *infection of Koch's old tuberculin* causes a general and also a focal reaction. A general reaction indicates that the patient has some focus of tuberculosis; the focal reaction, indicated by swelling and congestion, that the lesion is tuberculous. It is now rarely used in practice.

The *Mantoux test* consists of the intradermal injection of carefully graded or quantitative suspensions of tuberculin in saline or veal broth and range from dilutions of 1 in 10 000 or less, up to 1 in 100 or 1 in 10. In practice, 0·1 c.c. is injected and a routine dilution is 1 in 10 000. A control injection is made at the same time and a reaction is to be expected in positive cases in two to four days. A positive reaction consists of an infiltration surrounded by œdema and redness and may be mild or acute vesicular and sometimes ulcerated and is associated in very sensitive subjects with great œdema. It subsides in the course of a week or two.

This has almost completely replaced all other tests.

Von Pirquet's test. The skin is scarified as in ordinary vaccination and a 25 per cent. solution of old tuberculin (in a mixture composed of 1 part of 5 per cent. carbolic acid solution and 2 parts of normal saline) is applied. It is useful to scarify a corresponding area on some neighbouring part without applying the solution, as a control. In a tuberculous subject at the site of inoculation a small red swelling appears which the next day develops into a definite red papule. The lesion fades in a few days with slight desquamation. In some patients a wheal-like spot forms round the papule and occasionally there are small vesicles. This reaction, of course, only indicates that the patient has some focus of tuberculosis at some part of the body.

Calmette's test. One drop of a freshly prepared 0·5% solution of old tuberculin is applied to the conjunctiva. The reaction appears in from three to six hours. The eye looks red and there is some degree of swelling of the lids. Some unfortunate results leading to blindness have led to this test being rarely employed.

The *Patch test* is a method of applying old tuberculin to the skin. The patches are removed after twenty four hours and a positive reaction, consisting of erythema, œdema and vesicles or papules, occurs between the first and the sixth days and lasts four to ten days. Positive reactions are obtained in a high percentage of cases of cutaneous tuberculosis but not in those cases in which the skin is not involved nor in the non tuberculous. The patch test is often used as a routine in children although in the absence of skin lesions its value is doubtful.

Moro's test. This is performed with an ointment containing 10 per cent. of Koch's old tuberculin. It is rubbed vigorously into an area of the chest or abdomen about 3 inches square. At the end of twenty-four to forty-eight hours an eruption of small red papules appears on the area treated. This is a useful and easily applied test.

We have found that cases suspected of being tuberculous but proving by their healing rapidly under antiseptic fomentations to be septic, failed to react.

REFERENCE.—Medical Research Council. Special Report Series. No. 164. 1932. P. D'ARCY HART. "The Value of Tuberculin Tests in Man."

Miliary Tuberculosis of the Skin

Miliary tuberculosis of the skin is rare. It occurs as a part of general miliary tuberculosis. The patients are usually children, and there is often a history of a recent attack of measles or of some other acute specific fever. The lesions are acuminate red papules or papulo-vesicles, rarely minute pustules, varying in size from a pin's head to a hemp seed. The eruption

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Clinical tests for tuberculosis. The injection of Koch's old tuberculin, the Mantoux von Pirquet's and Calmette's tests the patch test, and Moro's ointment may be used. It must, however be remembered that particularly in an urban population a very high percentage of adults have at some time suffered from infection by the tubercle bacillus. The nature of such infections may have been unrecognised, but the patients may give a positive tuberculin reaction The clinical tests, therefore are of little practical value except when positive in young subjects or negative in adults

The *injection of Koch's old tuberculin* causes a general and also a focal reaction A general reaction indicates that the patient has some focus of tuberculosis the focal reaction, indicated by swelling and congestion that the lesion is tuberculous. It is now rarely used in practice

difficulty in diagnosis, but care has to be taken to differentiate the lesions from chancroid, from Hunterian chancre, and from epithelioma. In any doubtful case the lesion should be scraped and the tubercle bacillus sought for or a portion of the margin may be removed and stained for bacilli. *In rare cases an ulcer on the glans penis may be the first evidence that the patient has tuberculous disease of the urinary tract.*

Treatment. Though it cannot influence the visceral disease radical treatment of the ulcer is advisable and is usually successful. Under *anaesthesia it should be vigorously painted out with liq. hydrarg. nit. acidus* or destroyed by diathermy or it may be excised.

Tuberculosis verrucosa (Anatomical Wart. Verruca necrogenica)

(Gk. *nekros*, dead body)

Warty tuberculosis is the result of the direct inoculation of the skin with the bacillus of Koch. It may occur in the subjects of phthisis from



Fig. 214 Tuberculosis verrucosa (chronic type).

auto-inoculation, but is more commonly seen in medical men, nurses and others who are in attendance upon patients suffering from "open tuberculous disease. We have seen cases in which the hands have been

comes out rapidly and is generally widely spread. The spots may disappear with the formation of small scales or crusts but they occasionally break down into small ulcers Microscopically the *papules have a characteristic* tuberculous structure, and Koch's bacilli are found in them in great numbers The inoculation of guinea pigs is followed by tuberculosis.

The prognosis is necessarily grave and in most cases meningitis is the cause of death.

The Tuberculous Chancre or Primary Tuberculous Complex

A primary tuberculous infection of the skin characterised by a small indurated ulcer resembling the *syphilitic chancre and associated with a* regional bubo is described. The ulcer is indolent unresponsive to treatment and may persist for a year or more Tubercle bacilli are recovered from the lesion and the gland and a positive Mantoux reaction develops. In some reported cases an erythema nodosum has developed in the limbs after an interval of a few weeks and is regarded as corresponding to the secondary syphilitic eruption Lupus vulgaris has occasionally arisen in *the site of the healed primary lesion*

Acute Tuberculous Ulcer (Tuberculosis cutis orificialis)

The acute tuberculous ulcer is rare except in patients suffering from visceral tuberculosis. It has however been known to follow direct inoculation by virulent bacilli *e g.*, after ritual circumcision performed by a phthisical rabbi

We have seen several cases in patients suffering from phthisis in whom *the acute ulcer developed on the lower lip and buccal mucosa* Rarely the nares are affected. The infective agent is doubtless the sputum

In tuberculosis of the bowel and also in phthisis, tuberculous ulcer occurs about the anus often in association with a fissure

Some years ago Mr Hugh Lett sent Sequeira a boy of fifteen with an acute ulceration of the glans penis, secondary to tuberculosis of the kidneys and bladder He has seen one other case in which a similar ulceration *occurred in genito-urinary tuberculosis*

Dr Lewis Smith also had a case in which an acute tuberculous ulcer developed in a tracheotomy wound

Pathology Tubercles containing giant cells and epithelioid cells are found in sections of the ulcer in great numbers and Koch's bacilli are usually plentiful

Clinical features. The lesions are small dull red swellings which soon *break down to form shallow ulcers with thin undermined* edges. As a rule they are circular or polycyclic from the fusion of neighbouring lesions, but an individual ulcer rarely exceeds half an inch in diameter The base is somewhat irregular and minute yellow granules are seen on its surface and at the margin The ulcers are painless, except in parts which are liable to friction and movement, and then there is often great suffering *There is* no tendency to spontaneous healing but the lesions never become deep *The lymphatic glands are enlarged early*

Diagnosis If the presence of visceral tuberculosis is known there is no

removed by the curette and the parts then exposed to the X rays or a creosote and salicylic acid plaster (Leslie's) containing 33 3 per cent. of each drug may be used to destroy the thickened areas. The Finsen light is of great service after the warty excrescences have been removed by the plaster. The lesions rapidly dissolve under an ointment containing 15 per cent. each of pyrogallic and salicylic acids and resorcin in soft paraffin. The resulting ulcers heal under a boracic ointment dressing

Tuberculosis Colliquativa Scrofulodermia

(Lat. *scrofa*, a sow)

Tuberculosis colliquativa is the name given to certain forms of tuberculous abscess and ulceration, usually associated with breaking down tuberculous glands or with caseous foci in the bones and joints.

Etiology Children and young adults are most often affected with



Fig. 213. Scrofulodermia. Secondary to tuberculous cervical glands.

scrofulodermia, but occasionally the disease occurs in elderly subjects. The breaking down of foci of tubercle in the glands, etc., leads to the formation of sinuses, and the skin is secondarily infected from them.

Pathology Tubercles of the common type are found in the lesions embedded in granulation tissue, and Koch's bacilli may be demonstrated A characteristic is the undermining of the skin by the softening process

Clinical features. The neck, groins, and limbs are the common sites

infected by washing handkerchiefs used by phthisical patients. Warty tuberculosis is also met with in persons whose work brings them in contact with the bodies of those who have died from tuberculosis e g pathologists, post mortem porters etc Veterinary surgeons butchers and others who handle the carcases of tuberculous animals are also liable to infection

Pathology Tubercles with characteristic giant cells containing tubercle bacilli are found in the lesions, and there are often miliary abscesses in the vascular layers of the skin. In some instances it is difficult to find the organism but the inoculation of guinea pigs generally gives a positive result

Clinical features The lesions occur usually on the fingers and backs of the hands as these are the parts most likely to come in contact with the infecting organism. Two types may be recognised In the first, a small red swelling develops at the site of inoculation, and upon it a small pustule appears The swelling slowly enlarges to form a warty nodule with an infiltrated base surrounded by a zone of erythema. The appearance suggests an infected wart but the ordinary antiseptic applications have little or no effect. The pus removed from the small abscesses contains Koch s bacillus The lymphatic glands enlarge early In one such case where the lesion was at the root of the nose Mr Russell Howard and Sequeira were for some time in doubt whether the sore was not syphilitic as there was a hard bubo under the jaw At that time examination for spirochætes was unknown Wassermann s test was made several times, but was always negative. The bubo suppurated and tubercle bacilli were found in the pus

In the second type of case an ovoid or lobulated warty swelling forms, cicatrises in the centre, and spreads at the edge perhaps for several months or even years The characters of the fully developed lesions are peculiar There is a central depressed, often pigmented cicatrix around which is a ring of dark red warty nodules covered usually with a crust resembling putty and beyond this again is a zone of erythema often of a purplish tint The affection may be attended with slight itching The glands are sometimes involved and the viscera are occasionally attacked. In a characteristic case the primary infection took place in a butcher s shop where the patient pricked the back of his left hand with a wire The disease spread for three years and when the case was first seen the whole of the back of the hand was affected and the warty nodules were invading the fingers The patient lost his arm from secondary infection of the elbow joint from an epitrochlear gland. Warty tuberculosis may occur in post mortem porters and in others assisting at necropsies

Diagnosis. The early lesion resembles a common wart but is coloured a dull reddish brown and so are its base and its fringe The tuberculous lesion is differentiated from the extragenital chancre by the finding of the treponema in the latter and of the tubercle bacillus in the former Wassermann s test may be of value The more common warty lesions progress slowly and can hardly be mistaken for a syphilitic sore Granulomata due to actinomyces and blastomyces are diagnosed by the finding of the respective organisms in the pus

Treatment In acute cases the diseased area should be excised or destroyed by the cautery In chronic cases the warty masses may be

removed by the curette and the parts then exposed to the X rays, or a creosote and salicylic acid plaster (Leslie s) containing 33·3 per cent. of each drug may be used to destroy the thickened areas. The Finsen light is of great service after the warty excrescences have been removed by the plaster. The lesions rapidly dissolve under an ointment containing 15 per cent. each of pyrogallic and salicylic acids and resorcin in soft paraffin. The resulting ulcers heal under a boracic ointment dressing.

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Clinical features. The neck, groins, and limbs are the common sites

infected by washing handkerchiefs used by phthisical patients Warty tuberculosis is also met with in persons whose work brings them in contact with the bodies of those who have died from tuberculosis *e g* pathologists, *post mortem porters etc* Veterinary surgeons butchers and others who handle the carcases of tuberculous animals are also liable to infection.

Pathology Tubercles with characteristic giant-cells containing tubercle bacilli are found in the lesions and there are often miliary abscesses in the vascular layers of the skin. In some instances it is difficult to find the organism but the inoculation of guinea pigs generally gives a positive result.

Clinical features *The lesions occur usually on the fingers and backs* of the hands as these are the parts most likely to come in contact with the infecting organism Two types may be recognised. In the first, a small red swelling develops at the site of inoculation, and upon it a small pustule appears The swelling slowly enlarges to form a warty nodule with an *infiltrated* base, surrounded by a zone of erythema. The appearance suggests an infected wart but the ordinary antiseptic applications have little or no effect. The pus removed from the small abscesses contains Koch s bacillus. The lymphatic glands enlarge early In one such case where the lesion was at the root of the nose, Mr Russell Howard and Sequeira were for some time in doubt whether the sore was not syphilitic as there was a hard bubo under the jaw At that time examination for spirochætes was unknown Wassermann s test was made several times, but was always negative. The bubo suppurated and tubercle bacilli were found in the pus

In the second type of case an ovoid or lobulated warty swelling forms, cicatrises in the centre, and spreads at the edge, perhaps for several *months or even years The characters of the fully developed lesions are* peculiar There is a central depressed, often pigmented, cicatrix around which is a ring of dark red warty nodules, covered usually with a crust resembling putty and beyond this again is a zone of erythema, often of a purplish tint The affection may be attended with slight itching *The glands are sometimes involved and the viscera are occasionally attacked.* In a characteristic case the primary infection took place in a butcher s shop where the patient pricked the back of his left hand with a wire The disease spread for three years and when the case was first seen the whole of the back of the hand was affected and the warty nodules were invading the fingers The patient lost *his arm from secondary infection of the* elbow joint from an epitrochlear gland. Warty tuberculosis may occur in post mortem porters and in others assisting at necropsies

Diagnosis The early lesion resembles a common wart but is coloured a dull reddish brown and so are its base and its fringe The tuberculous lesion is differentiated from the extragenital chancre by *the finding of the* treponema in the latter and of the tubercle bacillus in the former Wassermann s test may be of value The more common warty lesions progress slowly and can hardly be mistaken for a syphilitic sore. Granulomata due to actinomyces and blastomyces are diagnosed by the finding of the respective organisms *in the pus*

Treatment In acute cases the diseased area should be excised or destroyed by the cautery In chronic cases the warty masses may be

before surgical interference is proposed and should follow any surgical treatment.

Local treatment with the Kromayer lamp is valuable and the breaking down of softened nodules may be hastened by painting with phenol or the pus may be aspirated with a syringe and a large needle. No active surgical treatment should be done until the patient's general immunity has been built up with careful dieting, open air, sunlight or U.V.L. and the usual tonics. Many cases of extensive lupus have followed impetuous



Fig. [illegible]. Scrofuloderma. Secondary to tuberculous glands.

excisions and some merit attaches to conservative measures which leave a localised tuberculous process to provoke its own specific antibodies.

Tuberculous lymphangitis may give rise to tuberculous abscesses resulting in scrofulodermatous lesions or may cause elephantiasis. It is a rare manifestation.

It occurs chiefly on the limbs. The primary focus is generally a warty tuberculosis or lupus on the extremity, such as a toe or a finger. Following this there appear at intervals along the limb a series of purplish nodules or cold abscesses, perhaps four or five, from the heel to the popliteal space, or along the forearm. These nodules are at first of a purplish or brownish tint, and break down into chronic indolent ulcers, discharging a sanious pus. The lesions heal up leaving depressed pigmented

of scrofulodermia but the face and trunk are sometimes attacked. Sequeira saw several instances where the disease developed over the buccinator muscle from breaking down of the buccal gland which is sometimes present. This gland drains the buccal area inside the mouth and also a small part of the adjacent skin

Tuberculosis colliquativa begins as a painless swelling in the subcutaneous tissue or the true skin. The epidermis over it becomes of a purplish red colour and then the central part of the mass softens In rare cases there is spontaneous resolution, but usually the skin gives way and an ulcer with overhanging irregular bluish edges forms The cavity is irregular and its base is covered with pale flabby granulations There may be pockets or fistulæ running in various directions and several adjacent lesions may communicate by tracks under bridges of thin purplish skin The discharge is sanious or serous or purulent, and tubercle bacilli may be found in it The destruction may extend deeply into the tendon sheaths and bones when the extremities are affected. In some cases a chronic form of progressive ulceration extends from the cervical glands on to the face and neck. The scar left after healing is irregular and often presents fibrous knotty masses or bands and tags, and occasionally bridges Atrophic areas and keloid scars are common It is usually adherent to the deeper structures and the parts may remain pigmented for a long time Phlyctenular conjunctivitis, conjunctivitis, keratitis blepharitis and nasal and aural discharges are sometimes found in association.

Diagnosis. Scrofulodermia is distinguished from common lupus by originating as a soft, purplish swelling associated with underlying caseous glands and other local tuberculous disease and especially by the absence of the apple-jelly like nodules of lupus vulgaris. It is not, however uncommon to find the two conditions coexisting and sometimes scrofulodermia is followed by true lupus

The syphilitic gumma is distinguished by its more rapid development, its elastic firm infiltration by the absence of gland and bone disease and in the ulcerating form by the punched-out character of the syphilitic ulcer There may be other evidences of syphilis present. The Wassermann test is often of great service but it must be remembered that coexistent congenital syphilis may very rarely complicate the diagnosis.

Bazin's disease affects young women almost exclusively and although the ulcerative phase may closely resemble scrofulodermia the sites of election differ for the lesions appear symmetrically on both legs, usually in the calves.

Actinomycosis, blastomycosis and sporotrichosis are differentiated by the presence of their respective organisms in the pus and their own characteristic features.

Prognosis. The prognosis is good scrofulodermia being much more responsive to treatment than lupus vulgaris There is usually however evidence of general debility

Treatment. In all cases the patient must have good food, and tonics such as cod liver oil and iron are required. A prolonged residence by the seaside especially on the east coast, is to be recommended As in lupus vulgaris calciferol in doses of 100 to 150 000 units daily is of great value Failing this intensive general ultra violet light should be given

before surgical interference is proposed and should follow any surgical treatment.

Local treatment with the Kromayer lamp is valuable and the breaking down of softened nodules may be hastened by painting with phenol or the pus may be aspirated with a syringe and a large needle. No active surgical treatment should be done until the patient's general immunity has been built up with careful dieting, open air, sunlight or U.V.L. and the usual tonics. Many cases of extensive lupus have followed impetuous



Fig. 216. Scrofuloderma. Secondary to tuberculous glands.

excisions and some merit attaches to conservative measures which leave a localized tuberculous process to provoke its own specific antibodies.

Tuberculous lymphangitis may give rise to tuberculous abscesses resulting in scrofulodermatous lesions or may cause elephantiasis. It is a rare manifestation.

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the ulcers there is often solid oedema, *elephantiasis* (Fig 238), and sometimes the lymphatic trunks may be felt as an indurated band. The nodules are caused by emboli in the lymphatic vessels. Tubercle bacilli and sometimes pyogenic organisms associated with them have been found, and inoculation experiments are positive The treatment is the same as that of scrofuloderma but the solid oedema usually persists. This, however should be controlled by firm supporting bandaging as with elastoplast.

Tumour-like forms of tuberculosis of the skin. Fungating tumours, described variously as tuberculosis fungosa tuberculosis vegetans and framboesiformis used to be seen as the result of infection by Koch's bacillus but are now rarely encountered. The lesions are red, irregular soft tumours or nodulated plaques and their surfaces may be ulcerated or covered with scabs. They are the result of direct inoculation or are secondary to glandular bony or joint infection. The tumour according to Pick consists of a plate of infiltration in the cutis, the swelling above it being formed of granulation tissue part of which has undergone caseous degeneration The condition may be mistaken for a neoplasm of the sarcomatous type mycosis fungoides or an erythematous morphoea

Chronic tuberculous ulcers. Occasionally chronic ulcerations of a rounded or oval or irregular outline, and with a soft undermined purple edge, are met with in scrofulous subjects There may be difficulty in determining whether the ulcers are syphilitic or tuberculous. The presence of an undermined edge, the chronicity of the lesions, and the absence of evidence of syphilis elsewhere will be a guide. In a doubtful case the Wassermann test should be made. The underlying infiltration is less firm and elastic in tuberculous ulceration. The ulcer and all infiltrated tissue may be destroyed by diathermy or may be curetted out and cauterised with liq hydrarg nit acidus or may be dissolved away with a 15 per cent. pyrogallic, salicylic and resorcin ointment. Subsequent X ray therapy is sometimes of value and general ultra violet light irradiation and attention to the general health are most important Calciferol is worthy of trial in all types of surgical tuberculosis (*vide* p 480).

Lupus vulgaris

(Lat. *lupus* wolf)

Lupus vulgaris is a clinical variety of tuberculosis of the skin in which the disease is localised in granulomatous nodules solitary aggregated or confluent, having a peculiar translucence which is enhanced by pressure under glass which reveals the characteristic apple-jelly nodules. It spreads by continuity and the formation of fresh foci and destroys the tissue involved either by ulceration or by sub-epidermal cicatrisation.

Etiology More than half the patients are attacked before the tenth and over 80 per cent. before the twentieth year Exceptionally the disease may occur in advanced life. Females are more frequently the victims of lupus than males the proportion being 70 and 30 per cent. respectively Although not confined to the poorer classes lupus is much commoner in the children of the indigent and ill fed than in those in better surroundings Dirt, bad hygiene, and insufficient food and actinic light have an important influence on the resisting power of the individual to

infection, and it is in children living in these conditions that we find the most destructive types of the disease. The work of Charpy in France and Dowling in this country indicates that vitamin D_2 deficiency is an important factor in lupus vulgaris. A history of tuberculosis in the family is found in a high proportion of the cases. In the patients seen at the London Hospital it was as high as 40 per cent. Lupus vulgaris is often associated with other tuberculous affections, particularly of the glands, bones and joints, but phthisis is uncommon, though it may be a sequel to the cutaneous affection. It is rare to find that lupus occurs in more than one member of a family. Ingram had four examples in 700 cases.

Climate appears to play an important part, and the disease is more



FIG. 247. Lupus vulgaris. Section showing infiltration and giant cells. ⅙ in. obj.

common in northern latitudes than in Southern Europe and is rare in tropical and sub-tropical regions.

The organism reaches the skin:—(1) By direct inoculation. Tattooing, piercing of the lobule of the ear for earrings, vaccination, morphia-syringe punctures, and, rarely, wounds have been followed by lupus. Scratching and picking the lesions of impetigo probably account for some cases. Infection of the inferior meatus of the nose may be due to inhalation of infected dust, but more probably to direct inoculation from infected fingers. Sequeira had under his care a case in which cold abscesses followed tuberculin injections for phthisis. These, in their turn, were followed by characteristic lupus vulgaris in three areas which had been the sites of inoculation. (2) By secondary infection of the skin from sinuses, etc., caused by the breaking down of tuberculous glands, and caseating foci in bones and joints. (3) By the softening of some distant focus and the escape of tubercle bacilli into the blood stream. This occurs most commonly after certain acute specific fevers, especially measles (lupus post-exanthematicus). (4) The more usual route, however, is by the



Fig. 248. Widespread lupus of the trunk

Fig. 249 Lupus vulgaris of thigh with reticular mottling (Livedo reticularis).

lymphatics from primary infection of the mucous membrane of nose or throat or from glands of neck.

Pathology The lupus nodule is a granuloma, consisting of masses of round nucleated cells, endothelioid and small lymphocytes or fibroblasts in a delicate reticulum of connective tissue from which the collagen and much of the elastin have disappeared, with many of the small blood vessels too. Giant-cells may be seen and plasma-cells are common Tubercle bacilli are present, but in very small numbers, and a large series of sections



Fig. 250. Lupus vulgaris.

may have to be examined before one bacillus is detected The centre of the lupus lesion tends to undergo fatty degeneration, but caseation does not occur The process destroys the glands and the hair follicles, and finally all the normal structures of the skin are replaced by scar tissue. The epidermis may be unaffected, but in long-standing conditions it may undergo atrophy or the horny layers may be greatly thickened. The injection of Koch's old tuberculin is followed by a focal reaction in the affected tissues, and similar results may be obtained by rubbing a 10 per cent. tuberculin ointment into the part. The inoculation of guinea pigs with lupus tissue gives positive results. Dr Stanley Griffith has isolated

both human and bovine types of Koch's bacillus and modifications of both. Positive reactions are also obtained by the Mantoux the Patch test von Pirquet's Calmette's and Moro's tests

Clinical features. Lupus may attack any part of the integument, and may spread to the mucous membranes or it may be primary in the mucous membranes specially that of the nose and invade the skin secondarily In 78 per cent of the cases seen at the London Hospital the face was affected first, the parts most commonly attacked being the nose cheeks and auricles Next in frequency came the neck. The hairy scalp forehead, and upper eyelids were usually avoided In only 8 per cent. of the cases were the trunk and extremities attacked and the disease was

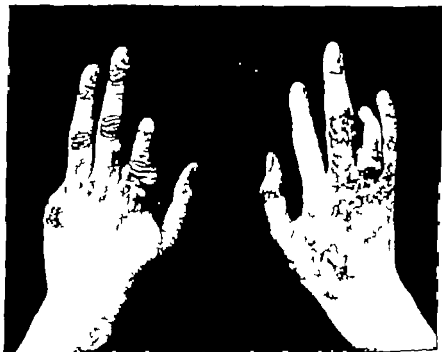


FIG. 251 Lupus mutilans.

exceedingly rare on the palms and soles in the axillæ and about the genitals and anus It may affect the buttocks

The mucous membranes were affected in over 45 per cent. of the patients attending the London Hospital In the Finsen Institute at Copenhagen, Christiansen found 80 per cent but the type of lupus seen in Denmark is much more severe than that met with in this country In a considerable proportion of the cases the mucous membranes are attacked primarily

There are many clinical forms of lupus but the primary lesion is nearly always a small "nodule or spot slightly elevated above the surface Its colour is pale yellow or yellowish red, to dark red with a brown tint and a translucency not unlike that of apple jelly (Plate 47) but the translucency may be masked by scaling The characters of the lupus nodule are best seen by examination in daylight under the pressure of a glass tongue depressor or diascope. The pressure removes the



Lupus Vulgaris

Boy aged twelve. The eruption was of eight years' duration. The jelly-like nodules are well shown. An area of scar is seen behind the main group.

both human and bovine types of Koch's bacillus and modifications of both. Positive reactions are also obtained by the Mantoux, the Patch test, von Pirquet's, Calmette's and Moro's tests.

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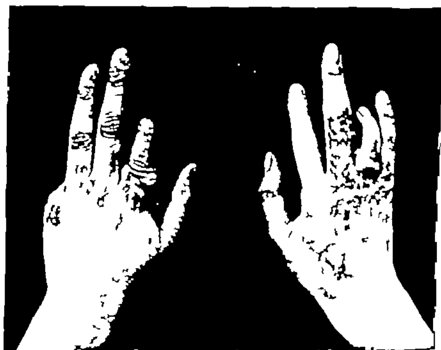


FIG. 251. Lupus mutilans.

exceedingly rare on the palms and soles, in the axillæ, and about the genitals and anus. It may affect the buttocks.

The mucous membranes were affected in over 43 per cent. of the patients attending the London Hospital. In the Finsen Institute at Copenhagen Christiansen found 80 per cent. but the type of lupus seen in Denmark is much more severe than that met with in this country. In a considerable proportion of the cases the mucous membranes are attacked primarily.

There are many clinical forms of lupus, but the primary lesion is nearly always a small "nodule" or spot slightly elevated above the surface. Its colour is pale yellow, or yellowish red, to dark red with a brown tint and a translucency not unlike that of apple jelly (Plate 47), but the translucency may be masked by scaling. The characters of the lupus nodule are best seen by examination in daylight under the pressure of a glass tongue depressor or diascope. The pressure removes the

surrounding hyperemia, and the non vascular apple-jelly-like spot stands out clearly. The primary focus is generally single but multiple spots are not uncommon. We have seen as many as twenty-seven separate lesions scattered widely about the face trunk and extremities. This variety is called lupus disseminatus, and commonly occurs after an acute specific fever. Lupus foci spread by peripheral growth, and adjacent areas often coalesce. In this way flat patches or elevated plaques are formed. In other cases the disease extends by a nodular margin, while the centre undergoes spontaneous cicatrisation, and in this way ringed, gyrate and



FIG. 232. Lupus of nose with ulceration of the tongue.

festooned figures are formed. Sometimes, also the disease creeps along the skin in one direction, leaving behind it a trail of scar.

There may be no breach of surface even in lesions which have lasted for many years. On the other hand, particularly in the more feeble and debilitated subjects, the nodules or patches break down to form ulcers. The dry forms of lupus may heal in part, very rarely entirely without treatment. In many instances there is an increase of the horny layers over the lupoid areas causing scaly patches (resembling psoriasis) and warty nodules. In other cases the lesions may be ulcerative from the onset, or they may begin as dry areas which subsequently break down. In many of the ulcerative cases the destruction is comparatively rapid, and

extremities are attacked there may be destruction of the fingers from coincident tenosynovitis, leading to grave deformity (Fig *31).

Lupus of the limbs may be associated with lymphangitis, leading to solid œdema, almost amounting to elephantiasis (Fig 253). Thickening of the lips also occurs from coincident invasion of the skin and mucous surfaces and from recurrent attacks of erysipelatous inflammation from associated streptococcal invasion.

The lupus scar is generally thin and white and fairly smooth but it is often unsound and may break down into fresh ulcers or become cheloidal

Variations in the activity of the process, depending upon varying conditions of the patient, and perhaps also upon the virulence of the organism, are common, while secondary infection with pus organisms always tends to more rapid destruction.

Lupus of the mucous membranes. The disease commonly attacks the inferior meatus of the nose where it may be primary or secondary to affection of the skin. From the nose it may spread upwards along the nasal duct to the lachrymal sac, and even to the conjunctiva. Epiphora is a common symptom of early nasal lupus, and shows that the nasal duct is obstructed. The disease may also pass backwards from the nose to the naso-pharynx, and through the anterior palatine foramen to the front of the hard palate. Both hard and soft palates may be affected, and also the mucous membrane of the gums and lips and of the buccal cavity The pharynx and larynx may be involved, and there is reason to believe that the disease may extend to the middle ear The nose is by far the most frequently attacked, then come the lips and buccal mucosa and palate The tongue is rarely affected (Fig 25*). The primary lesion on the mucous membrane is a slightly raised patch with a granular or uneven surface, upon which small ulcers develop. In the nose the lesions are usually covered with crusts. The gums are swollen and red, and ulcerated, loosening the teeth.

Course of lupus. The disease always runs a very chronic course but the process is sometimes comparatively rapid when there is superadded pus-coccal infection Cases lasting twenty and thirty years or throughout life are not uncommon. Recurrences after apparent cure are frequent. The physique of the patient is, as a rule, poor and there is a tendency to the development of other forms of tuberculous disease. In many cases, however the general health is not seriously affected.

The ulcerating forms of the disease lead to grave deformity—for instance destruction of the nose, perforation of the cartilaginous septum, atresia of the nostrils, ectropion of the lower lids, contraction of the buccal orifice, and mutilation of the auricles and of the extremities.

Complications. *Erysipelas* is not uncommon, especially in cases showing elephantiasis. *Visceral tuberculosis* is not frequent, but may lead to a fatal issue. Pulmonary complications are the most common, especially in connection with lupus of the naso-pharynx. Fifteen deaths occurred from phthisis and two from tuberculous meningitis in over a thousand cases of lupus at the London Hospital. Bone and joint tuberculosis also occur

Epithelioma (Fig 254) may develop upon cases of lupus of long duration. It was the cause of five deaths in a thousand cases at the London Hospital clinic. It rarely occurs unless the disease has been in progress for twenty

about the nose mouth etc. may lead to grave deformity The lesions may take a pustular serpiginous or vegetative form The lupus ulcer varies in depth and character in different subjects Its edge may be raised and present characteristic jelly like nodules or it may be thickened and scaly or warty The base is indolent and often covered with crusts or with



Fig. 233. Tuberculous elephantiasis. Female, æt 41

vegetations Limited areas of ulcerative lupus may simulate impetigo or rupia The bones and muscles are not implicated, but where the nose and ears are affected the cartilage is often destroyed, and great disfigurement results Lupus vulgaris always leaves permanent scars. In rare instances the ulcerative process may be of phagedænic type and when the

are superficial and opaque. Sealy and horny plugs often mark the orifices of the sebaceous glands. It is nearly always symmetrical, and affects the nose cheeks, and auricles; there are no apple-jelly nodules, and the disease usually starts at a later age. The only difficulty lies in the superficial form of lupus of the face called "lupus tuberculeux erythemateux of Leloir" in which there are true nodules, but these are only recognisable upon biopsy. Some of the small superficial or miliary forms of Boeck's sarcoid closely resemble lupus as may the facial nodules in rosacea and the acnei form tuberculides.

Syphilis, especially the nodular and ulcerative tertiary forms, may lead to considerable difficulty but the following points should be borne in mind. Lupus arises in childhood or early life and takes years to cause the destruction which syphilis may cause in a few weeks to a few months. The syphilitic gummata show no apple-jelly nodules, and the ulcers are round, or tending to be round, and punched out in character. If the nose and palate are affected necrosis of bone points to syphilis. Lupus does not destroy bone. In doubtful cases the Wassermann test should be done and the effect of treatment noted.

Usually the nodules of leprosy are more raised than those of lupus; they are of a dull earthy colour and have no apple jelly translucency. Where there is any real doubt, a nodule should be excised. In lepra, Hansen's bacilli are found in large numbers and recognition is quite easy. The presence of anæsthetic patches and of a thickened ulnar nerve of course, points to leprosy.

If blastomycosis, actinomycosis and sporotrichosis are suspected, the organisms of these diseases should be sought.

In lupoid sycosis the lesions are pustular from the onset, and even in the most chronic cases pustules are seen about the hair follicles at the margin.

Treatment. The treatment of lupus vulgaris may be considered from three points of view: (1) Measures adapted to increase the resisting power of the patient to the invading organism (2) the destruction or removal of the bacilli; and (3) the destruction or removal of the lesions produced by them with as little injury to the healthy tissues as possible.

The resistance of the patient is improved by good feeding particularly the use of fat, milk, cream, cod-liver oil by attention to the general hygiene, a life in the open air being of great value and by the administration of tonics, such as iron and arsenic. Dietetic treatment has received much attention. The Gerson diet, modified by Herrmansdorfer and Sauerbruch is essentially rich in uncooked fresh foodstuffs and salt free. Investigations conducted in hospital over periods of two years and more by such careful observers as Brunsgaard and Jesionek leave no room for doubt as to the great value of such treatment when properly controlled, in curing skin tuberculosis, especially lupus, and rendering intractable cases amenable to local measures. Treatment requires prolonged hospitalisation, modern dietetic facilities and co-operation of the patient for the *régime* is unpleasant.

The administration of vitamins A and D has always been considered of value, and striking confirmation of this has been recently reported by Dowling and Prosser Thomas who used massive doses of calciferol. Unknown to them at the time, Charpy and other French workers had

years. Males are more liable than females doubtless as the result of their being more exposed to irritation by climatic and other conditions. Prolonged X ray treatment of lupus vulgaris accounted for some of the cases of epithelioma arising on lupus

Diagnosis Lupus has to be distinguished from other forms of *cutaneous tuberculosis* from lupus erythematosus and from syphilitic and other granulomata

Scrofuloderma occurs in the same class of patient, and even in the same individual usually preceding lupus in this event The lesions arise



Fig 234. Epithelioma on lupus of 23 years duration

about caseating lymphatic glands or tuberculous foci in the bones and joints and consist of soft purplish swellings containing pus or softened caseous material which is never seen in lupus. There are no apple jelly like nodules and the irregular ulcers have a thin undermined bluish edge

The tuberculous ulcers which occur about *the orifices of the body* are only seen in advanced visceral tuberculosis. They are acute in their development, *and have thin undermined edges* The conditions classed as tuberculosis verrucosa may be difficult to distinguish, but their non translucent warty character and appearance on the extremities often with a history of infection, should make the diagnosis clear

Lupus erythematosus should rarely give rise to trouble for its lesions

are superficial and opaque. Scaly and horny plugs often mark the orifices of the sebaceous glands. It is nearly always symmetrical, and affects the nose cheeks, and auricles there are no apple-jelly nodules, and the disease usually starts at a later age. The only difficulty lies in the superficial form of lupus of the face called "lupus tuberculeux erythemateux of Leloir" in which there are true nodules but these are only recognisable upon biopsy Some of the small superficial or miliary forms of Boeck's sarcoid closely resemble lupus as may the facial nodules in rosacea and the acneiform tuberculides.

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The administration of vitamins A and D has always been considered of value, and striking confirmation of this has been recently reported by Dowling and Prosser Thomas who used massive doses of calciferol. Unknown to them at the time Charpy and other French workers had

obtained similar successful results and there is no doubt that calciferol is at present the most valuable remedy for lupus vulgaris In Dowling's series of cases the maximum dose of calciferol the Glaxo product ostelin being used, was 150 000 i u daily this being reduced *after varying periods* to 100 000 or to 50 000 i u daily The vitamin was *given continuously for* months or for periods of two months with intermissions. Of 32 cases treated, 18 appeared to be cured 9 were considerably improved and 5 only showed moderate improvement Our experience has not been so favourable but we have no doubt concerning the value of the treatment

Calciferol vitamin D_2, is prepared from irradiated ergosterol and this synthetic product is not found in fish or natural oils but its antirachitic properties correspond to the naturally occurring vitamin D_3 (irradiated 7-dehydrocholesterol)

Calciferol is potentially toxic and although many patients have tolerated 250 000 to 400 000 units a day others soon complain of nausea, loss of appetite vomiting diarrhœa and polyuria It is advisable that dosage should not exceed 10 000 i u daily per pound of body weight and renal and cardio-vascular diseases are contra indications Considerable increases in serum calcium and phosphorus may occur but more importance should be placed upon clinical symptoms of intolerance

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In a few cases of lupus of the ulcerative variety benefit has resulted from tuberculin injections but in the ordinary dry type success from tuberculin injections is rare

The Light Bath Before the introduction of calciferol therapy the greatest advance in the treatment of lupus was the irradiation of the whole body There is now a large variety of apparatus which can be utilised for actinotherapy Carbon arcs with tungsten cores give a spectrum closely approximating that of the sun, but good results are also obtained by mercury vapour lamps emitting a high proportion of actinic rays

Exposure of the body to actinic light produces —

(1) Erythema in the irradiated area This is usually transitory and may be followed by desquamation.

(2) Pigmentation The degree varies with the duration and number of exposures and with the individual. The source of light also has an influence. The carbon arc causes a deep brown colour while the mercury vapour lamp produces a greyish brown tint This, no doubt depends upon the greater penetration of the rays of the carbon arc.

(3) A moderate increase in the body weight in some cases

(4) An increase of hæmoglobin, calcium and phosphorus in the blood.

(5) A slight increase in the white cells mainly affecting the lymphocytes.

(6) An increase in the bactericidal action of the blood is supported by clinical and experimental observations.

(7) The effect of ultra violet light irradiation on the sterols in the skin is to elaborate vitamin D_3. Probably this is why massive doses of vitamin D_2 are so successful

(8) Steady improvement and actual healing without local treatment, of surgical tuberculosis and of lupus vulgaris both of the skin and mucous

membranes. In lupus the combination of local light treatment with the light bath gives 90 per cent. of cures.

(0) A marked improvement in the general health of the patients.

The only untoward result seen in light bath treatment, whether the illuminant be the sun or an artificial source is the occasional "flare up" of a tuberculous process, especially where there is pyrexia. This is to be expected in pulmonary tuberculosis. It is therefore wise to refer the lupus patient for clinical and X ray examination and not to expose to general light baths if active visceral tuberculosis is found or even suspected In all cases it is important to watch carefully the effect on the temperature and other symptoms. It is generally accepted that the patients whose skins pigment best make the most rapid and complete recoveries, presumably because such individuals are able to tolerate the intense and sustained treatments which appear to be essential for good results.

The light bath treatment should be given daily over long periods and should always be combined with one or other form of local treatment Neither treatment alone is as effective as the combination

The *local treatment* of lupus has for its aim the removal or destruction of the tubercle bacillus and the products of its activity with as little destruction of the healthy tissue as possible For this purpose chemical caustics, the cautery erasion, excision and actinotherapy are all used

The *acid nitrate of mercury* solution may be used with great advantage It is applied on a pointed slip of wood or glass pencil, which is bored into individual nodules of lupus. The reaction to the caustic is dressed with a simple antiseptic ointment Where the nature of the scar is of little moment this measure is of great utility but keloid formation occasionally follows and the lupus if not destroyed will be more difficult to approach on this account. For large areas on the limbs we have used with advantage *creosote and salicylic acid plasters* 83 3 per cent. of each. The plaster is applied hot and left in place for forty-eight hours at a time and after one or more applications the softer lupus nodules often slough out, leaving small pits, which heal up under an antiseptic dressing This treatment is often advantageously combined with phototherapy and radiotherapy An ointment composed of pyrogallic acid, salicylic acid and ichthyol, of each forty grains to the ounce in vaselin may be useful to thin down warty masses of lupus. *Erasion* still has many advocates and the immediate results are often very satisfactory The operation is performed under a general anaesthetic. The curette should be used boldly to clear away every part of the diseased area which will yield to its edge. After scraping the area should be well swabbed over with phenol or liq hydrarg nit. acid, in the hope of reaching any organisms which have not been removed by the curette, and of sealing up lymphatic spaces which have been torn open in the operation. Unless very thoroughly done there appears to be some risk of the scraping leading to the infection of the surrounding tissues, and we do not advocate it, except in some warty and fungating cases Scraping may be followed by keloidal scarring

Excision of lupus areas with skin grafting is a surgical measure which is sometimes successful. Occasionally it is followed by a relapse at the site or round the margins. This is usually due to removal not being deep enough, and any nodules which thus occur are extremely difficult to deal

with Excision cannot be recommended as a treatment for choice on the face unless the area is very small On the limbs and elsewhere, where the resulting scar is of little moment, it is often the best method of treatment as it has the great merit of rapidity Excision should always be followed by six months daily ultra violet light irradiation of the whole body

Moogrol—phenyl-ethyl hydnocarpate—used in the treatment of leprosy has in recent years been employed with success in the treatment of lupus The solution, 0 1 to 0 25 c.c. is injected into the lupus nodule superficially so as to raise a wheal on the skin This is followed by a reaction which often destroys the lupus We have found some cases respond to this when they have resisted all other measures but response is variable The use of this drug as a general measure by intramuscular injection has



FIG 233. Lupus Vulgaris (dry variety). Twenty five years duration before and after Finsen treatment.

not been successful in our hands, and even local treatment should be combined with general actinotherapy or with calciferol therapy

Local actinotherapy for over forty years has held the foremost place in the treatment of lupus since it gave the best cosmetic results It should be considered in those cases proving sluggish or unresponsive to the calciferol treatment and it may be found advantageous to combine local and general treatment as in the past. Unfortunately local actinotherapy is very tedious and expensive, and requires an elaborate apparatus and skilled attention on the part of the nurses It cannot be applied to an ulcerated area, and is not often practicable for the treatment of lesions of the mucous membranes The essential of Finsen's technique is the concentration of actinic light by means of rock-crystal lenses, fitted in a tube on to the affected areas The light is produced by a powerful arc lamp, and the heat rays are absorbed by passing the beam through a column of distilled water At the focus of the rays the skin is compressed by an apparatus consisting of two pieces of rock-crystal fixed in a metal ring Through this compressor a current of cold water passes con

stantly The compressor is held in position by an attendant or in some situations, fixed by a special holder and the sitting lasts for at least one hour Six hours after the application a blister forms, which is dressed with a soothing or antiseptic ointment, and healing takes place in from ten days to a fortnight. An area the size of a shilling can be treated at one sitting and in an extensive case the treatment may have to be carried on for several months, and even years. The best results are obtained in cases of dry lupus which have not been subjected to erasion or other measures which cause scarring Relapses are not common, except in cases where there is disease also of the mucous membranes. Lombolt s modification of

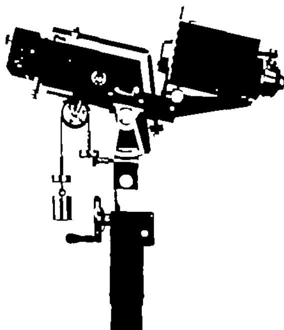


FIG. 256 The Finsen-Lombolt Lamp.

the Finsen lamp (Fig 256) is a further great advance in this form of treatment. The arc is brought close to a lens of fused silica the rays are passed through solutions of cobalt and of copper sulphate and ammonia to remove heat rays and so a greater concentration of light is brought to the lesion, reducing the necessary time exposure. The weight of the lamp is used for exerting the necessary pressure by tilting These lamps are worked from a source of direct current at 25 to 30 amp at about 50 volts. Kromayer s mercury vapour lamp gives intense reactions with a ten minutes application. This is a small mercury-vapour burner cooled by the continuous flow of water through a jacket surrounding the burner Its disadvantage in the treatment of lupus is that the actinic rays have a shorter wave length and much less power of penetration than those

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The subjects of tuberculides commonly suffer from acrocyanosis and chilblains.

Erythema Nodosum

There is an increasing body of evidence and of opinion supporting the view that erythema nodosum, which is certainly a reaction that can be provoked by a great variety of infective organisms, is nevertheless commonly tuberculous in this country especially in young people. There seems no doubt that the incidence of tuberculous erythema nodosum in Scandinavia is very high, and it is likely that the cause of this eruption varies in different countries and with different races.

Erythema nodosum is characterised by tender painful, rose pink, nodose erythematous lesions nummular in size, occurring particularly on the front of the shins and sometimes also on the ulnar borders of the elbows and occasionally on the face being associated with some little oedema of the part affected and some general ill-health and malaise and very frequently a rise of temperature. The patient is ill and has commonly to be kept in bed for a period, but the affection usually subsides with rest in the course of a few weeks, the lesions themselves characteristically fading through the colours of a bruise.

In this connection it is important to stress that every case of erythema nodosum, especially those occurring in young people should call for careful investigation with a view to excluding or confirming the presence of active tuberculosis especially of the lungs and mediastinum.

When erythema nodosum is tuberculous it tends to arise within a reasonably short period of the initial tuberculous infection or within a short period of an exacerbation of a previously quiescent infection (see p. 248).

Acne and Lichen scrofulosorum

Lichen and acne scrofulosorum are common tuberculides. Their relationship with tuberculosis has long been recognised.

Etiology Most of the patients are children or adolescents, suffering from tuberculosis of the glands, bones and joints or of the skin, but rarely from phthisis. Injections of Koch's old tuberculin have occasionally been followed by the eruption, and the histology of lesions thus caused differs in no particular from those arising in connection with visceral or gland tuberculosis.

Pathology The little papules consist of miliary tubercles of characteristic structure, containing epithelioid cells and giant cells. Often there is no more than lymphocytic infiltration with or without pustulation. A local reaction is obtained in the majority of cases after the injection of tuberculin. The tubercle bacillus has very rarely been demonstrated in the lesions.

Clinical features. The eruption consists of rounded acuminate, discrete papules of a pale yellow or brownish tint, and occasionally almost the colour of the surrounding skin. They vary in size from a pin's head to a millet seed. There is sometimes a central depression to the papule, and a minute adherent scale may be attached to its summit. Rarely the lesion

emitted by the carbon arc. The scars are not so smooth nor so supple as those produced by the Finsen apparatus. It is however of considerable service in extensive superficial lesions on the extremities. Phototherapy by the local application of concentrated light (Finsen treatment) gives from 60 to 70 per cent. of cures but if combined with the light bath treatment (*vide* p 490) the percentage is increased to 90 under favourable conditions

There is some little place for X ray therapy in the treatment of ulcerated lupus but such gross deformity and suffering have been caused in the past and so great is the risk of epitheliomata developing that it is the general opinion to-day in view of the great advance with calciferol therapy and in general and local light treatment that X rays should never again be employed as a major therapeutic measure for the local treatment of lupus

It is important that mouth, throat or nasal sepsis should be removed with lupus about the face and neck otherwise it may delay recovery

Secondarily infected lupus often responds remarkably to penicillin or to a sulphonamide internally

The Tuberculides

Allergic reactions to the tubercle bacillus and tuberculous toxin may assume a great variety of forms depending on the type and age of the patient and the type and age of the infection. Furthermore, there is very little doubt that given the particular type of patient or phase of sensitivity to infective organisms or toxins exactly similar reactions to those we call tuberculides can be provoked by organisms other than the tubercle bacillus or its toxins for example, the treponema of syphilis, the streptococcus, ringworm fungi etc.

The histology of the lesion may or may not suggest tuberculosis tubercle bacilli are rarely demonstrated and inoculation of guinea pigs is rarely successful Though these eruptions which tend to be symmetrical and bilateral may last months or years, they tend to spontaneous cure

It is not suprising that a great number of affections have been described in this category and that the nomenclature is abundant and confusing We shall try and describe these affections in groups which seem to us to be related to a particular phase of sensitisation

Reference should be made to Goldsmith s Recent Advances in Dermatology for the history of the various theories brought forward to explain the tuberculides following Darier s original grouping of affections under that title in 1896 The essential features of these reactions are that they are benign eruptions symmetrical and often peripheral in distribution showing a tuberculous histology without demonstrable presence of the organism and often occurring in tuberculous subjects

Tuberculides are of various types and include the following —

(1) Erythema nodosum.

(2) Acne and lichen scrofulosorum

(3) Papulo-necrotic nodular and ulcerative lesions.

(4) Some cases of lupus erythematosus and granuloma annulare (see the appropriate section)

(5) Sarcoidosis

contains a minute bead of pus. The eruption is usually grouped in oval or crescentic patches There are no symptoms and the affection is often unnoticed by the patient The papules may last for months, and even years, and gradually clear up usually without, but occasionally with, scarring The eruption may recur The trunk is most often affected, especially about the shoulders and hips.

Diagnosis. Lichen and acne scrofulosorum have to be distinguished from certain other papular eruptions. *Lichen planus* and *lichen nitidus* occur on the forearms and fronts of the legs and on the thighs occasionally on the trunk The papules are of a peculiar lilac or violet tint, shiny and flat topped. Itching is usually pronounced, and there are white patches commonly in the mouth. Tuberculides being essentially allergic in origin an exactly similar eruption may occur with a trichophyton infection, the so-called *lichen trichophyticus* or papular trichophytide (Fig 225 p 422). It occurs in connection with the deep type of ringworm—kerion celsi and a similar condition may be associated with favus Similar eruptions may occur with streptococcal and other infections. *Papular eczema* is attended with itching the onset is more acute, and vesication is common The *papular syphilide* is of a brownish or hammy tint, the lesions are scaly at the margin and are much larger except in the fine follicular syphilide and there are other signs of syphilis

Prognosis The prognosis of lichen scrofulosorum is favourable but its presence suggests that the patient is tuberculous

Treatment. Cod liver oil and general tonics good feeding and an open air life are indicated. Arsenic internally is of service. Locally inunction of cod liver oil is advocated by many eminent authorities. Ointments of ichthyol resorcin and tar are also of value but the essential treatment is that of the underlying cause

Papular and Nodular Tuberculides

The papulo necrotic and ulcerative tuberculides or as the French term them, the tuberculous gummata may be manifest as dermal or as subcutaneous lesions Histologically and etiologically they are of exactly similar significance—indeed, they often occur together and are evidence of a particular phase of sensitisation to the tubercle bacillus which can rarely be demonstrated but has upon occasion given a positive guinea pig inoculation. The lesions are seen with other tuberculides for example the rosaceous tuberculide and certain papulo-pustular and papulo-necrotic tuberculides of the face In this group also should be included the lesions sometimes termed *acne cachecticorum*—small and large follicular necrosing lesions affecting seborrhoeic sites, for example, face and neck—pectoral and pelvic girdle and limbs.

Rist and Rolland s researches have thrown a new light on the tuberculides. They believe the cutaneous tuberculides to be a manifestation of allergy in subjects in whom there is a focus of tuberculosis. The tuberculides are therefore spontaneous examples of *Koch s reaction* This reaction presents certain points of interest which are worthy of note in this place

A primary inoculation of Koch s bacilli in a guinea pig produces after a latent interval of from two to twelve days according to the dose of the

organism and its virulence, a nodule which softens and ulcerates. The ulcer is rounded or irregular its edges are raised and infiltrated, and it rests on a deep induration. It exudes a caseous pus or is covered with crusts and contains numerous bacilli. The nearest gland enlarges, and later there is bilateral glandular infection, and the ulcer retains its characters till the death of the animal in two or three months.

If, after an interval of a month or more, the animal is re-inoculated with Koch's bacilli, the lesion produced at the site of re-inoculation has quite different characters. There is œdema from the first day. In a few days a brown, indurated plaque forms, and in five or six days a slough begins to separate. The base of the sore left after the slough has come away is formed by the superficial muscular layer of the region. Cicatrisation goes



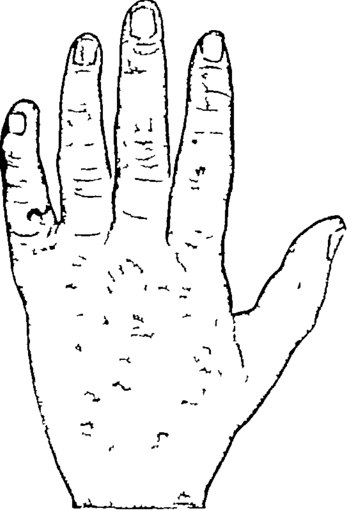
Fig. 227. Necrosing tuberculide. Small type. Girl, æt. 11. The lesions were symmetrical.

on rapidly under a crust, and about a month after the re-inoculation a perfectly supple scar is left. Bacilli are extremely rare in sections of such lesions even twenty-four hours after re-inoculation. Everything points to a rapid destruction of the organisms introduced, and upon this depends the rapid healing of the lesions. Rist and Rolland suggest that the tuberculides are caused by endogenous re-inoculation, and clinically the lesions present many points of resemblance to the phenomenon of Koch, which is caused by exogenous re-inoculation. Similar phenomena probably account for the syphilitic gumma.

The various types of eruption in this group are:—

(1) The papulo-necrotic tuberculide, acnitis, folliclis, with necrosing papular lesions situated in the dermis.

(2) Acne cachecticorum and other necrosing follicular tuberculides.



PAPULO-NECROTIC TUBERCULIDE. Female aged 22. Active necrosing lesions, scars, acro-asphyxia.

[To face p. 497

the acne cachecticorum type on the trunk, folliclis on the limbs and also tuberculous ulceration of the skin.

Acnitis (Barthélemy) Acne agminata (Crocker). It is not yet agreed that this form of skin eruption is tuberculous, but there is good evidence that it is similar to the diseases described in this section. Varioliform acne hydradenitis suppurativa and acne telangiectodes are synonyms for this affection. The eruption consists of rounded, brown papules imbedded in the skin. At first they are about the size of a millet seed but they may reach the dimensions of a pea.

The forehead and temples are the seats of election but the eyebrows and eyelids and the skin over the angle of the jaw may also be affected. In rare cases the trunk and limbs are attacked. There is no fever and no pain but the patient may complain of itching. Soon after their appearance the papules become red and soften; small pustules form and the scanty exudate dries up into crusts, which fall off leaving small pigmented scars.

Treatment. Recognising that the subjects of these forms of eruption are tuberculous, attention must be directed to the improvement of the patient's general health. Cod-liver oil, calciferol, iron and arsenic, with good food, plenty of milk, cream, and fat, and above all where possible, residence by the sea, are of greater importance than the local treatment. Stimulant antiseptic ointments and lotions are the best local applications. The red oxide of mercury ointment is one of the most useful in our experience. A paste containing 10 per cent. ol. morrhuae in yellow oxide of mercury is also of service. Focal reactions may also be produced by the Kromayer lamp. If the lower extremities are affected, rest in the horizontal position must be enjoined. In some cases tuberculin, B.E. in 1/10,000 milligram doses, has proved of value. Light-bath treatment has been used in some cases with advantage, but great care must be observed, especially where there is hilum phthisis. In no case with pyrexia should general light baths be prescribed. We have seen cases of this group respond to sulphonamides by mouth, to gold and to arsenic by injections.

Tuberculides of the Hypoderm. Erythema Induratum of Bazin

Bazin's disease is a chronic malady affecting young girls almost exclusively. It is characterised by symmetrical node-like swellings of the legs and occasionally of the upper limbs. The lesions are chronic and tend to break down into indolent ulcers.

Etiology. Erythema induratum usually begins in adolescence and is rare after twenty-five. The patients are nearly always young girls, and often those who have to stand at their occupations. It is therefore commonest in young shop assistants, domestic servants and the like. The patients are often overworked and underfed, and it is not uncommon to find evidence of tuberculosis in the glands, etc. Telford and Dixon Wright do not regard Bazin's disease as tuberculous but as a primary vascular disorder to be treated by sympathectomy. We do not subscribe to this view; indeed the condition cannot, in our opinion, be explained on any other than tuberculous lines and its common association with tuberculous lesions of glands, etc., is unquestionable, although cold and circulatory taxis are predisposing factors.

Pathology. The affection starts in the hypoderm with dense focal infiltration, endo- and periphlebitis and fat necrosis. Fluid removed from

(3) Erythema induratum (Bazin's disease) with similar necrosing lesions situated in the subcutaneous tissues

Colcott Fox collected twenty different names which have been given to eruptions of this type. The nomenclature depends upon accidental characters such as the affection of the follicles of the skin or the depth of the lesions and their tendency to necrotic changes In all forms the eruption is symmetrical and commonly associated with bad peripheral circulation and has a tendency to affect the extremities

Etiology The patients are usually young and the subjects of tuberculosis of the cervical mediastinal or abdominal lymphatic glands or of the lung or of some other form of tuberculosis of the skin

Pathology Some of the lesions appear to be about the follicles but in the majority the primary affection is a phlebitis probably due to infected thrombi Infiltration of lymphocytes and histiocytes occurs about the small vessels of the dermis Giant cells may be found with necrosis and in rare instances tubercle bacilli have been demonstrated

Clinical features. Dermal type The lesions are flattened rounded papules in the deep part of the skin, giving the sensation of shot imbedded there They vary in size from a pin's head to a lentil seed. The colour is dusky red or purplish, and the papule is surrounded by an erythematous zone (Plate 48) The subsequent course varies In some instances the papules disappear spontaneously leaving small pigmented stains More commonly the summit is noticed to contain a little serous fluid, and finally a small pustule appears in the centre. This dries up to form a small cone-shaped crust or scab which on removal reveals a conical ulcer which runs an indolent course The coalescence of two or more neighbouring lesions may produce an irregular ulcer The ulcers on healing leave depressed pigmented scars The eruption is not painful but there are tenderness, and occasionally itching Crops of the spots may appear for several months or even years but an individual lesion usually lasts for several weeks only Symmetrical painless effusion into the knee joints may occur rarely in children suffering from this form of tuberculide. Erythema induratum (Bazin's disease) occasionally follows this condition.

The eruption appears in patients subject to acrocyanosis, and the hands and feet and the elbows and knees are the seats of election The auricles are also frequently attacked, and the scarring may lead to atrophy Occasionally the palms and soles are affected but the face generally escapes The outbreaks often occur during the spring and autumn

Prognosis This variety of tuberculide runs a chronic course, but the ultimate prognosis is good. Its presence must, however be taken as probable evidence of tuberculosis.

Acne cachecticorum. This eruption occurs in the same type of patient. It appears on the face back chest, and lower limbs and consists of papules and pustules varying in size from a pin's head to a lentil seed of a livid purplish red colour closely resembling a syphilide In some cases there are hæmorrhagic lesions The eruption may persist for several years but clears up with the improvement in the general health of the patient Small scars or pigmented spots are left

Darier recorded the case of a patient who suffered from phthisis and scrofulous glands of the neck, axillæ and groins in whom there were lesions of

area of degeneration in the subcutaneous fat. Such is more likely to occur in individuals suffering from cold extremities, acrocyanosis or true perniosis (*vide* p. 803). Sympathectomy relieves these conditions and greatly accelerates healing but it is a serious and irrevocable procedure and we have rarely seen indications justifying our advising it.

Clinical features. The lesions are red or purplish red, indurated, ill-defined plaques of various sizes, but usually about half to three-quarters of an inch in diameter. The seats of election are the lower part of the calf and the outer or posterior aspect of the leg. As a rule there are several plaques on each leg. Occasionally similar indurations are seen on the upper extremities. The swellings appear subacutely and vary in size from time to time. In many cases the nodes break down into rather deep ulcers with a punched-out edge, a greyish or red base surrounded by an area of infiltration. They run an indolent course, tend to clear up in the summer and when healed leave pigmented depressed scars which ultimately become white. The cicatrices simulate those of syphilitic gummata very closely but they are nearly always symmetrically placed on both legs.

Diagnosis. Bazin's disease must be distinguished from several forms of hypodermic nodules and indurated plaques. The essential features are its occurrence in young girls mostly in the winter, its predilection for the calves, its chronic course, and its symmetry. A chronic chilblain condition met with in young women may closely simulate Bazin's disease. This condition termed *erythrocyanosis cruris* (p. 803), appears as localised bluish, purplish or dark red macules on the backs of the legs just above the heels. The lesions are naturally most obvious in the coldest weather being a variety of chronic perniosis but after a season or two the discoloration may persist throughout the year. There is little induration and ulceration is the exception, in contrast to Bazin's disease in which ulceration is the rule. The syphilitic gumma usually occurs later in life. It is generally asymmetrical, and there are other signs or a history of syphilis. Scrofulodermia occurs in relationship with breaking down tuberculous glands or caseating foci in the bones and joints and is thus extremely rare on the sites of Bazin's disease. Lesions due to sporotrichia could only be differentiated by the finding of the organism. Varicose veins are associated with nodular infiltrations due to phlebitis, and the patient is usually older.

Treatment. Any visceral or glandular tuberculosis should be treated appropriately as should any other evidence of ill health. Sunlight baths are not so helpful in the treatment of these reactions. Gold and N.A.B. injections are often effective as may be the sulphonamides and tuberculin, but the eruptions tend to recur over a number of years.

Local treatment aims at correcting the sluggish peripheral circulation which accounts for the cold skin. Such measures as massage, infra-red irradiation, radiant heat, diathermy or galvanic baths are very useful. Adhesive elastic bandages retain heat and provide the equivalent of massage and when a single bandage fails a double one may succeed. Rest in bed is imperative if the above measures fail. During convalescence, after the ulcers have healed, elastic bandages should be worn in cold weather. The ulcers may be painted with 2 per cent. aqueous gentian violet or dressed with ung. hyd. ox. rubra or pasta hyd. ox. flav., to which 10 per cent. of cod liver oil may be added with advantage.

a non ulcerated lesion resembles liquid fat. Giant-cells of tuberculous and foreign body types and epithelioid cells have been demonstrated in the tissue. Granular necrosis of the cellular infiltration causes a softening of the tumour and destruction of the skin Koch s bacillus has not been demonstrated in the tumours or in the fluid removed from them, but Colcott Fox and others have infected guinea pigs with tuberculosis by injecting material derived from the lesions. Positive results are obtained with old tuberculin and with von Pirquet s and Calmette s and Moro s tests.

Dr Western had a patient suffering from tuberculous disease of the



FIG 238 Erythema induratum Ulcers and extensive scars. Girl, æt. 18.

ankle, for which he had been giving tuberculin (bacillary emulsion) in the usual way and in whom lesions indistinguishable from Bazin s disease appeared in the leg He has had a similar case, in which the cutaneous affection appeared after injection of the same tuberculin for scrofulous glands of the neck.

Erythematous nodules appear after the injection of tuberculin intra dermically but the swellings more closely resemble erythema nodosum. It therefore seems probable that some forms of erythema nodosum are related to Bazin s disease

It would appear that the tuberculous process requires as a nidus an

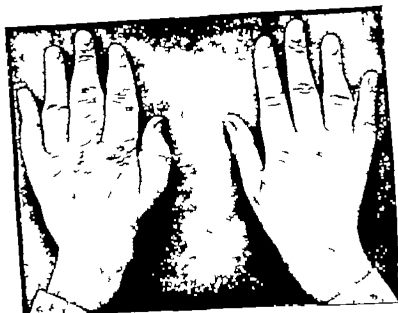


FIG. 260. Benign lymphogranuloma. Sarcoidosis, showing involvement of the phalanges (see below).



FIG. 261. Benign lymphogranuloma. Radiogram of hands. (Dr Savatard's case.)

face, hands, feet or upper arms, though they may occur on other sites. A generalised infiltration of the skin with exfoliation is also described.

Over discrete lesions, especially of the larger type, telangiectasia may be marked.

The Mantoux reaction is negative or feebly positive.

Sarcoidosis, Schaumann's Disease. Multiple Benign Sarcoid of Boeck

(Gk. *sarx* flesh)

There is still considerable discussion as to the correct interpretation of a varied group of eruptions resembling tuberculides and commonly labelled sarcoids which are, according to Schaumann's conception manifestations of general lymphogenous disease, probably tuberculous in origin, which he labelled lymphogranulomatosis benigna as opposed to lymphogranulomatosis maligna or Hodgkin's disease to which it bears close resemblance



FIG 250 Sarcoid.
Lupus pernio type. Hands feet small bones and glands involved Negative Mantoux.

The group is best considered under the name of Schaumann's disease or syndrome and includes—apart from visceral lung, liver bone marrow glandular and tonsillar involvements—the eruptions previously described as Boeck's sarcoids hypodermic sarcoids of Darier Roussy and possibly other affections as tuberculous uveoparotitis. The tendency in general medicine is to classify this group with the reticulo-endotheliosis.

Boeck first described this type of lesion as "lupoid" in 189-

Sarcoids may be papular nodular or in plaques and present a finely speckled, translucent, *yellowish red or purple infiltration* commonly on the

CHAPTER XXIII

CHRONIC BACTERIAL INFECTIONS OF THE SKIN (cont.)

LEPROSY

(Lepra Elephantiasis Græcorum)

(Gk. *lepra*, feminine of *lepros* scaly)

LEPROSY is a chronic constitutional specific disease characterised by (1) the formation of granulomatous nodules in the skin and mucous membranes, or (2) peripheral neuritis with trophic disturbances, or (3) a combination of these.

Etiology Lepra is not now indigenous in this country It occurs in Norway Russia, and the Mediterranean. It is endemic in India, China, and Japan, and in the West Indies, Central and South America, and the islands of the Pacific, in South and Central Africa, and in Queensland. It is estimated that there are 1 200,000 lepers in India and probably 2,000,000 in the British Empire. In the United States and Canada it occurs chiefly in the Scandinavians who have settled there.

The infective organism is the *bacillus lepræ* of Hansen. It is believed by Rayon and Kedrowski to exist in two stages: a nocardial or streptothrical form which is not acid fast and a bacillary and acid fast stage. The latter closely resembles the tubercle bacillus It has not been grown on artificial media, but successful inoculation of the monkey has been reported. It is believed that infection takes place commonly through the nasal mucous membrane, and occasionally through wounds but there is little reliable evidence on this point. Lamborn demonstrated that the bacilli may not only be passed by flies but be deposited by them on food. The bed-bug has also been suspected as a carrier of infection.

The period of incubation is unknown. It has been variously estimated at from a few weeks to several years. Sequeira has notes of a case in which the first symptoms were not noticed until the patient had been borne from Burmah seven years, and another in which nine years elapsed betwen the probable time of infection and the appearance of symptoms.

Lepra is contagious in a low degree, and close and probably prolonged contact is apparently necessary Rogers found that cohabitation accounted for about 20 per cent. of infections, although it is well known that a man may not give the disease to his wife even when they have been living together for many years. He also found that 40 per cent. of the 700 cases studied were due to living usually for years, in the same house with a leper including 9 per cent. sleeping in the same bed. In the remaining 40 per cent. there was a clear history of close and prolonged association with leprosy about half this percentage occurring in attendants. Rogers also mentions the case of a doctor infecting himself experimentally by inoculation and concludes that there is no doubt that lepra bacilli gain access to the skin through abrasions and insect bites during close association with an infective type of the disease. We know of one little group of three cases in one family The mother father and one child out of three suffered from leprosy Cases of

As indicated above, similar infiltrations may occur in any tissue in the body and are readily demonstrated in bones of the extremities (as cystic degeneration) and in the lungs and tonsils and glands

Extensive invasion of reticulo-endothelial tissues throughout the body may produce grave debility and anæmia but the course of the disease is generally very protracted It may become stationary or even resolve spontaneously

With the development of active tuberculosis and a positive Mantoux reaction, sarcoid lesions tend to clear spontaneously

Histology characteristically shows well-defined focal masses of endothelial cells but sometimes there is considerable lymphocytic infiltration

Males are rarely affected. Most of the patients are females between fifteen and forty

Treatment. The general health requires attention. Injections of tuberculin and of calcium and vitamin D are recommended. Arsenic in the hands of Boeck proved valuable Gray suggests intravenous injections of sodium morrhuate ½ c c. of a 3 per cent solution and Barber favours gold injections.

Hypodermic Sarcoids of Darier and Roussy

Darier and Roussy have described a condition which appears to be related to Bazin s erythema induratum The lesions are chronic indolent granulomata in the hypoderm but have no tendency to ulceration. They occur chiefly in females between the ages of thirty and forty They vary in size from a pea to a nut and often form nodular patches or cordons. They may occur anywhere, but are usually seen on the trunk in the costal regions Giant cells and lymphocytes are found, and the lesions are surrounded by a fibrous envelope. The tuberculous nature of the disease has not been proved by inoculation and Koch s bacilli have not been demonstrated.

The Reticuloses and Sarcoidosis We have mentioned previously that *sarcoidosis is sometimes included in the reticulo-endothelioses* (p 135) and Goldsmith (1944) discussed their relationship In the tuberculoid reactions the epitheloid cells are thought to be derived from histiocytes and these phagocytic cells to belong to the reticulo-endothelial system although their origin is still undetermined The histological pictures of the various reticuloses may indicate granulomatous inflammation hyperplasia or a neoplastic process but these findings may not conform with the clinical features Goldsmith reported a case of lupus pernio with histology suggestive of lymphatic leukæmia or lymphosarcoma a second case resembling Fig 250 showed the histology of lymphocytoma and later assumed the picture of lupus erythematosus and responded to gold therapy The association of leukæmic dermatomyositis with poikiloderma has been reported and cases of the latter with generalised adenopathy and leucocytosis even simulating Hodgkin s disease or lymphosarcoma Instances of parapsoriasis especially of the reticulate type, being followed by mycosis fungoides further complicate the problem of the reticuloses (p 240)

Reference—W N Goldsmith Brit Journ Derm. and Syph 1944 56, 107

lepromata. The bacillus is found in the lymphatic glands and in the spleen and kidneys. In nodular leprosy the testes atrophy and become fibrotic. Amyloid disease of the bowel, liver spleen and kidneys occurs in chronic cases of the nodular type.

During attacks of "lepra fever" the Wassermann reaction is often positive although there is no evidence of syphilis. It is uncertain whether this is or is not due to the stimulation of a latent infection. In mild or quiescent leprosy a positive Wassermann may usually be taken as indicating co-existent syphilis or yaws.

In nerve leprosy there is an inflammation of the connective tissue of the nerves, and in this the bacillus is found. The nerves are irregularly thickened, and the fibrous causes degenerative changes in the nerve fibres, leading to atrophy of muscles and to trophic changes in the skin and deeper structures. Small perineural abscesses may occur.

Clinical features. It has been customary to describe leprosy as of three types the nodular maculo-anæsthetic and mixed forms. However these are really expressions of one infection and in any country where the disease is prevalent all types from the simple hypo-pigmented patch to extreme mutilation may be found. Certain types are commoner in some countries than in others, and it would appear that this largely depends upon the standard of nutrition of the population.

It is believed that in the first stage of the disease the nerve terminals are affected. By what channel the organisms reach them is unknown. The bacilli are supposed to travel along the nerve sheath and cause an inflammatory reaction in its connective tissue. The nerve-fibres are compressed and characteristic phenomena appear. The earliest sign is a patch in which there is a diminution of the normal pigmentation. This hypo-pigmented area is never white like leucodermia. Such patches occur on the cheeks the external aspects of the limbs and over the scapulæ and buttocks. The subjective symptoms are shooting pains and pruritus. Sometimes the patches are distinctly hyperæsthetic. In place of the deficiency in pigment one sometimes sees hyper-pigmentation.

Irregularly patchy anæsthesia is soon manifest, but the insensitive areas do not always correspond with the hypo-pigmentation. The most common parts in which anæsthesia may be detected are those supplied by the ulnar and peroneal nerves. The epicritic sensibility is lost before the protopathic. The order in which appreciation of sensation is lost is as follows: (1) fine temperature sense (2) fine superficial tactile sense, (3) gross pain and temperature and (4) deep pressure sense.

While these phenomena are appearing the inflammatory changes in the connective tissue of the nerve trunks usually lead to thickening which in certain sites can be distinguished clinically. The ulnar nerve where it passes behind the internal condyle the peroneal at the head of the fibula, and the great auricular as it crosses the sterno-mastoid can be felt and sometimes seen. Sequeira had a case in which the external cutaneous nerve of the forearm could be felt and seen under the skin. Sometimes definite nodular or fusiform thickening of the nerve trunks may be made out by the examining fingers.

In rare cases an eruption of bullæ resembling pemphigus may occur at the onset of "nerve leprosy."

contact leprosy have been reported in Great Britain and in the United States In all of these the disease was contracted from persons infected abroad There is no actual evidence of heredity however though probably a predisposition may be inherited. Some would prefer to consider lepra a household disease It is curious that sometimes leprosy is introduced into a small community and persists there for generations, but segregation efficiently enforced tends gradually to stamp it out.

Pathology Histologically a leproma consists of small round cells, spindle cells and the so-called lepra cells The last are large multi



Fig 202. Nodular leprosy Lepromata on the cornea

nucleated and vacuolated. They may be packed with Hansen s bacilli Brownish granular bodies—" globi —may also be present. They appear to be degenerate lepra cells The microscopical appearances suggest that the skin nodules are caused by emboli of the organisms. Small lepromata occur in the submucosa of the nasal cavity larynx and pharynx and these lesions may ulcerate.

Hansen s bacillus is found in large numbers in the lesions in great contrast to the sparsity of the organisms in lupus and some other tuberculous conditions The organisms are excreted in the nasal mucus, in saliva, tears, milk and fæces During febrile attacks they may be found in the blood. They are often numerous in the discharge from ulcerating

physical tiredness, rheumatic pains and attacks of leprotic fever with profuse and sometimes localised sweating.

In a few instances the first signs noticed are cutaneous lesions, but a careful examination will usually demonstrate pre-existing involvement of the nerves.

The skin eruptions in leprosy may be classed as rashes and nodules.



FIG. 264. Maculo-anaesthetic leprosy

They first appear at the periphery of the areas of hypo-pigmentation. Their edges become elevated and red, and a more generalised erythema may surround them. If portions of the skin of the raised margin be excised and examined microscopically the bacillus of Hansen may be found. At this period the organism may often be demonstrated in scrapings or smears from the nasal mucosa. The erythematous and raised

Evidence of involvement of the motor nerves usually comes later but sometimes an early facial palsy may be seen

At this period there is no nasal discharge, and a microscopical examination of portions of the affected skin gives negative results. A bacteriological diagnosis cannot, therefore be made. It is however very important that the disease should be recognised at *this stage for it is then most* amenable to treatment Further it is the stage in which concealment is most likely to occur should measures of segregation be in operation We know of a case in which an Indian boy was removed from school to school

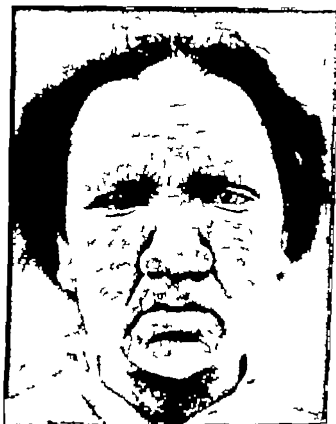


Fig 263. Nodular leprosy

in different parts of a colony as soon as the nature of his ailment had been recognised

The later course of leprosy depends mainly upon the resistance of the patient. If this be good the disease may remain limited more or less to *the nerves* first involved, and may go on to a condition in which the fibrotic changes in the nerves cause trophic lesions.

In a large proportion of the patients, especially in many tropical countries where the standard of nutrition is low or where intercurrent disease such as tuberculosis or syphilis lowers the resisting power *further* developments take place Symptoms pointing to general infection and, particularly, lesions of the skin and mucous membranes become manifest The general *symptoms* are headaches malaise a feeling of mental and

and atrophy of muscles lead to contractions. Of these a characteristic one is the "leper claw" (Fig 265). Foot-drop with inversion and various distortions of the limbs and face may occur. The atrophic lesions are ulcers, common on the heel and ball of the foot, and bullous eruptions. The small bones of the extremities may be absorbed, and from necrosis of the soft parts digits or parts of digits may fall off.

An indication of the increasing resistance of the patient is the formation of scar tissue and paralytic and trophic changes are really sequelæ. The advanced cases with grave deformity therefore are rarely contagious. But it must be remembered that even in apparent cures some foci may remain latent, ready to light up under conditions of impaired health.

We have already mentioned that tuberculosis and syphilis are complications which may be dangerous. In some leper colonies tuberculosis is said to be common. Luetic patients require adequate treatment by arsenic and bismuth. It is curious that sometimes an attack of small



FIG. 265. Nerve leprosy. The "leper claw."

pox benefits the leper and apparent cure has been recorded. Vaccination is also said to ameliorate the condition.

Classification of cases. The Leonard Wood Memorial Conference recommended the symbols, N, C, and NC respectively to stand for neural, cutaneous and mixed leprosy respectively. Each class is again subdivided with numerals to indicate the degree of severity. C1, C2, C3 stand for different degrees of cutaneous lepra. N1C3 would indicate a mixed case with different degrees of skin and nerve involvement. These indices may prove convenient in assessing the value of treatment in large collections of cases. While the letters C and N may indicate scientific differences it is obvious that the numerals attached will depend on the personal equation of the observer and that two sets of statistics from different clinics are not strictly comparable.

Diagnosis. Many attempts have been made to produce clinical tests which would aid in the early diagnosis of leprosy. Immunity reactions have not so far proved of value. Leprolin has been used intradermally and sterile emulsions from lepromata have been found by some workers to be of assistance in the diagnosis of early cases.

patches may increase to a large size and in their centre the integument is hypo-pigmented, atrophic, hairless and does not sweat. That the visible eruption in no way corresponds with the actual involvement of the skin was well shown in a case which had been treated by the intravenous injection of methylene blue (Montel's method). The patient, a European, showed a very large number of spots of all sizes stained bluish grey far in excess of the areas clinically recognisable before the injections.

The nodules of leprosy are almost certainly produced by emboli of the bacilli. The nodules at first are small pinkish papules, which gradually enlarge and by coalescence form infiltrated brown or yellowish brown plaques with an irregular rather nodular surface. On palpation the nodules are elastic, hard and feel greasy. At first the nodules may be hyperæsthetic, but, later, sensation may be lost.

The eyebrows, alæ nasi, cheeks, lips and ear lobes are most commonly affected. The flexor aspects of the limbs, the chest, axillæ, scrotum and penis may also be involved. The palms and soles escape. The enlargement of the nodules and the extension of the infiltration produce great disfigurement. The bosses on the eyebrows, cheeks and nose give the patient a remarkable appearance which has been called "leonine" (Fig. 263). The nodules on the eyebrows are devoid of hair.

The nasal mucosa is studded with nodules which ulcerate early and thus causes snuffling and a discharge containing crowds of acid-fast bacilli. The buccal, pharyngeal and laryngeal membranes are also affected and a curious croaking voice is the result. There may be pain on mastication and deglutition. The disease may even extend to the bronchi.

The eyes are often severely affected in leprosy. In Fig. 262 lepromata are seen on the cornea. The eyelids may be invaded. Iritis and iridocyclitis, sometimes leading to complete disorganisation of the eye, are not uncommon.

The lymphatic glands in the affected areas are enlarged but suppuration does not occur.

The late stages of the nodules vary. Sometimes they remain stationary for long periods. In others they break down and ulcerate. In others a cicatrising process occurs and stellate scars are left. In rare instances the skin becomes sclerodermatous.

A curious feature in both sexes is the frequent hypertrophy of the nipples of the breasts from infiltration with leprous tissue.

The involvement of the skin is commonly accompanied by febrile attacks. It is believed that these are caused by the breaking down of small foci and the escape of bacilli into the blood stream. The pyrexia is associated with headaches, malaise, pains in the limbs, and neuralgia. There is also in the late stages a more continuous fever with wasting, asthenia and sweating, and this may be the antecedent of a fatal issue.

The careful clinical study of nodular leprosy shows that there is almost invariably involvement of the nerves. These so-called cases of nodular leprosy are really mixed cases.

"*Lepra mutilans*" is the late stage of the disease in which the nerves have been destroyed by the contracting perineural infiltration. This destruction causes various paralyses and trophic phenomena. Both superficial and deep sensation are lost more or less completely. Paralysis

The ulceration in the nasal cavity healed but otherwise there was only temporary alleviation. It was interesting to note that the dye picked out innumerable small foci of the disease in areas which appeared healthy It

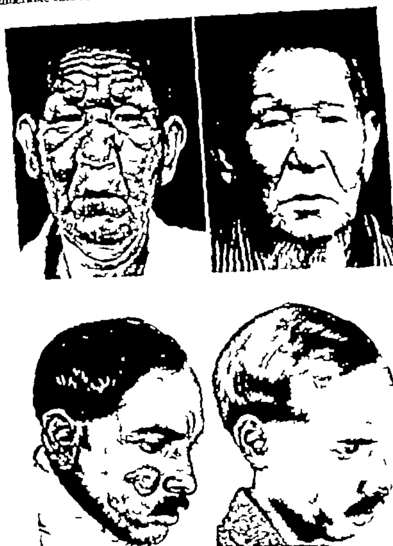


FIG 247 Nodular leprosy before and after treatment.
(By courtesy of British Empire Leprosy Relief Association.)

is possible that the combination of dye-therapy with hydnocarpates might be of value as suggested by Montet.

We were not much impressed with the effect of diphtheria formol toxoid used by Collier in Thailand. The sulphanilamides have proved of no value We strongly deprecate the administration of large doses of iodide of potassium formerly advocated. There is no doubt that there is

marked erythema and thickening of the integument, and less hypo-pigmentation, and (3) the nerve trunks are less thickened. In such cases Hansen's organisms are plentiful in the skin and in the nasal secretion In advanced cases new foci continue to appear and the whole skin may be involved In those non resistant cases in which sedimentation of the erythrocytes is slow the outlook is more favourable but prolonged treatment and careful watching are necessary

Treatment. The sufferer from leprosy requires good food, and as wholesome surroundings as are possible Daily baths should be taken, and ulcerated surfaces demand the usual antiseptic applications. No specific cure for leprosy is known Chaulmoogra oil is undoubtedly of value and is well worth a prolonged trial If the patient's digestive organs permit the dose should be gradually increased from three minims of the oil up to a drachm or more thrice daily The oil is given in capsule Rogers found that gynocardic acid was more effective and less nauseating than the whole oil Intramuscular and intravenous injections are now widely used The following formula has strong advocates —

Chaulmoogra oil 150 c c olive oil 147 c.c. iodine, 1 gram eucalyptus oil 4 c c camphor 2 grams intramuscular injections of 10 c.c are given

Of late years endeavours have been made to obtain the active principles of the oil and it is now recognised that there are two fatty acids chaulmoogric acid (formerly called gynocardic) and hydnocarpic acid. Sir Leonard Rogers advocated the hypodermic injection of gynocardate of soda (gr ij in 1 c.c. water) or the intravenous injection of $\frac{1}{10}$ grain gradually increased to $\frac{1}{2}$ grain once a week.

Another favourite formula is Muir's E.C C.O which has the following composition —Ethyl ester of hydnocarpus oil 1 c.c. camphor 1 grm. creosote (double distilled) 1 c.c. olive oil 2 5 c c This is given intravenously and also intramuscularly Lancashire found alarming symptoms following injection into a vein but intramuscular injections were well borne. The initial dose is 0 5 c c gradually increasing to 2 5 c c Bi weekly injections are given.

Anti leprol a refined constituent of chaulmoogra oil is also used Three to five c.c are given by intramuscular injection or 15 minims to 2 drachms by the mouth Gurgun oil has also been advocated.

Considerable success is also reported to follow injections of 0 5 c.c of sodium morrhuate It is given at the same intervals as hydnocarpus preparations Mercury also has its advocates Nastin, a fatty extract made from a streptothrix which has been suggested as being peculiar to leprosy mixed with benzoyl-chloride and dissolved in anhydrous olive oil has been tried extensively Beneficial results have attended the hypodermic injection of 10 c c. once a week Sequeira tried it in several cases without appreciable improvement but it has been attended with no untoward symptoms Salvarsan and neo salvarsan have also been given with doubtful results Antimony is strongly recommended by Cranston He injects intravenously 5 c c of a 2 per cent solution of tartar emetic

Montet claimed benefit from the intravenous injection of methylene-blue in an extensive series of cases. Burkitt of Nairobi and Sequeira watched the case of a young male European treated by Montet's method.

some tropical countries. It affects the poorer classes beginning in youth or early adult life.

Pathology The disease is caused by the *Bacterium rhinoscleromatosis* described by Frisch, a Gram-negative organism. The lesions are caused by a peculiar infiltration in the corium. There is dense small cell infiltration but the special elements are large hyaline and colloid cells. A special feature are the "foam cells" (Mickulicz cells). In the cells of the tumours and in the glands the bacillus is found. The sclerotic character is caused by dense fibrous connective tissue. There is never any tendency for the growth to break down. The epidermis is little affected, but down growths closely resembling cell nests have been described.

Clinical features. The disease begins insidiously with the formation of painless pink or red nodules in the anterior nares, or on the surface of the nose or the adjacent part of the upper lip sometimes in the buccal cavity and pharynx, and very rarely in the external auditory meatus. The lesions are well-defined, smooth infiltrations of the true skin or mucous membrane, of a peculiar cartilaginous or stony hardness. By their fusion plaques or masses form which may block up the anterior nares, or lead to stenosis of the naso-pharynx and even the larynx. The surface is smooth and tense and tends to fissure or crack The process is essentially chronic and may last for many years death occurring usually from pulmonary complications. It is locally malignant, tending to recur after removal.

The **diagnosis** has to be made from syphilis, cheloid, and the malignant neoplasms.

Treatment. Surgical interference except at the very earliest stage, is uniformly unsuccessful and if the nares can be kept patent, there is little indication for treatment. Some improvement has been reported from the application of the X-rays.

REFERENCE.—V. FRISCH. *Wien. Med. Wochenschr* 1882, 32.

a considerable risk of causing fresh outbreaks of leprotic lesions We only use iodide with the view to increasing nasal secretion for demonstrating Hansen's bacillus in a doubtful case

The nodules of lepra can be removed by the X rays, but it is necessary to set up a distinct inflammatory reaction The rays have no influence upon the course of the disease Chaulmoogra oil rubbed in locally is believed to be advantageous but intradermal injections are better

In the nerve variety of leprosy strychnine has been recommended Arsenic sometimes appears to be useful

The question of the segregation and efficient treatment of the cases of leprosy which come into the British Islands from time to time has been under consideration, and an institution has been built for their accommodation

In some tropical countries *e g* India the problems are so big that any system adequate to cope with it completely " would engulf the medical resources of any budget (Cochrane) The segregation of *all* lepers is unnecessary and wasteful of effort and leads to concealment in the stages in which treatment may be used with advantage. Cochrane of the British Empire Relief Association, states that the essentials now required are —

(1) A complete survey of an infected area indicating age and stage of disease

(2) Open cases require isolation in an institution or in special huts in villages

(3) Active cases should be treated, particularly children

(4) Contacts and non active cases should be followed up and examined periodically

(5) Propaganda should emphasise that (a) leprosy is an ordinary disease communicated by close contact and is neither venereal nor a curse of God (*b*) only certain cases require treatment (*c*) early treatment is essential (*d*) in non infective cases children need not be excluded from school nor workers from their employment (*e*) only patients who are infective require isolation, others can be treated at clinics as out patients

REFERENCES—HANSEN and LOOFT Leprosy in its Clinical and Pathological Aspects. Translation by Norman Walker 1901 Wright, Bristol Leprosy SIR LEONARD ROGERS and E. MUIR. Wright Bristol, 1946. Contact cases in Great Britain, J M H MACLEOD *British Medical Journal* 1925 I p. 107 SIR LEONARD ROGERS Progress in the Control of Leprosy in the British Empire. *Brit Med. Jour* 1946 Jun. I 825

Those who desire to keep abreast of the various aspects of leprology should consult the *International Journal of Leprosy* On Prognosis ERNEST MUIR gives a useful paper *Lancet* 1936 II p 448

Rhinoscleroma

(Gk. *rhis rhinos* nostril *scleros* hard)

A chronic microbic affection of the nose and upper lip characterised by tumour formation of cartilaginous hardness with involvement and closure of the nasal fossæ

Etiology Rhinoscleroma occurs endemically in Eastern Europe especially in Austro Hungary and Russia It has also been observed in

it. The whole organism appeared to be enclosed in an envelope but there is some doubt if that might not be artefact.

Noguchi showed that the organism can be grown on agar and ascitic fluid in which are suspended small pieces of rabbit's tissue. Wile and his colleagues point out that specimens from Noguchi cultures were morphologically different from treponema obtained from human lesions. It is to be noted that organisms from such cultures after several generations are not pathogenic to rabbits.

The exact biological position of the treponema pallidum is not yet determined. Meirowsky and Schereschewsky have shown what appear to be lateral and terminal bud-like bodies, and also fusion of the treponema pallidum, and on these grounds the organism would be classed as a vegetable parasite. On the other hand McDonagh claims to have demon

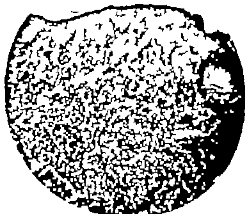


Fig. 309 Section of primary chancre.

strated intracellular stages of the organism with a sexual cycle E. H Ross also described the development of the treponema from intra-cellular bodies.

Recent work by Levaditi and his colleagues suggests that the spirillar form, so valuable in diagnosis, is only one stage in a developmental cycle of the organism. Further that in this stage it is not infective The hypothesis that the treponema has an ultra-microscopic phase would explain certain difficulties relating to congenital infections but the supporting evidence is inconclusive

The treponema is found in large numbers in the primary sore, in the glands, mucous membrane lesions, recent papules and condylomata. It is less common in the macule. In the stage of generalisation it may be detected in the blood, spleen, and adrenals. It is said that the organism may be demonstrated in the fluid raised by a blister applied to a dry lesion. In tertiary lesions it is very rare and apparently less active.

There is good evidence that the treponema may be circulating in the

CHAPTER XXIV

CHRONIC INFECTIVE DISEASES OF THE SKIN

Syphilis—Ulcus Molle—Granuloma Inguinale Tropicum

Syphilis

(After Syphilus character in 16th century poem)

SYPHILIS is a general infectious contagious, and hereditary disease caused by the *Treponema pallidum* (*Spirochæta pallida* *Spironema pallidum*) All organs of the body may be attacked but the major affections are of the skin and mucous membranes the cardio-vascular and nervous systems The cutaneous manifestations only will receive special notice here

Etiology The *Treponema pallidum* (Gk. *trepo* I turn *nema* thread) discovered by Schaudinn in 1905 is a spirillar organism 6 to 14 μ long and 0·5 μ broad It forms 6 to 10 or more spirals and at either extremity there



FIG 208 *Treponema pallidum from a chancre Preparation by Dr* McIntosh, London Hospital Dark-ground illumination

is a flagellum of extreme tenuity It is believed that the movement of the organism is produced by this flagellum and it does not twist spirally on its axis but moves by a series of undulations in the same plane Examined in hanging drop it preserves its motility for some hours.

Prof Wile and Drs Pickard and Kearney of Ann Arbor have examined *treponemata* by the electron microscope giving magnification up to 9,000 diameters increased by photography to 70 000 diameters but have added little to our knowledge beyond the demonstration of fine hair like flagella along the organism The technique flattens the treponema and immobilises

it. The whole organism appeared to be enclosed in an envelope but there is some doubt if that might not be artefact

Noguchi showed that the organism can be grown on agar and ascitic fluid in which are suspended small pieces of rabbit's tissue. Wile and his colleagues point out that specimens from Noguchi cultures were morphologically different from treponema obtained from human lesions. It is to be noted that organisms from such cultures after several generations are not pathogenic to rabbits.

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Fig. 200. Section of primary chancre.

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There is good evidence that the treponema may be circulating in the

blood stream before the appearance of the primary lesion Bickers published the case of a girl of 17 who three days after the birth of a child, developed a chancre on the left labium minus The Wassermann was

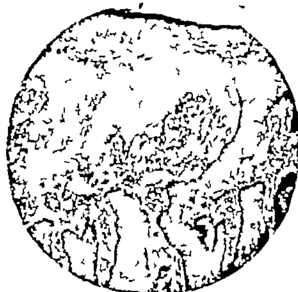


FIG 270 Section of papular syphilide condyloma.



FIG 271 Section of syphilitic gumma

negative but became positive later and a secondary rash appeared five weeks after the primary manifestation The infant when three weeks old presented peri-anal sores, fissures at the angles of the mouth and its blood gave a positive serological reaction

The treponemata are abundant in the syphilitic fœtus and in the skin

lesions and organs (liver spleen, adrenals, and lungs) of the congenital syphilitic infant.

Monkeys can be inoculated, and the contagion can be conveyed, under special conditions to rabbits, dogs and sheep.

Possible Variations in Type Certain clinical observations have suggested the possibility of there being two types of treponema, one prone to attack the cutaneous system and the other having a special affinity for the brain and spinal cord. Long ago Sir Frederick Mott pointed out that in many general paralytics and tabetics there was little or no evidence of cutaneous syphilis, and the clinical histories of some cases observed in Paris tended to show that a particular woman transmitted a neurotropic type of syphilis to several men. Marie and Levaditi have shown certain differences in the incubation period of different types when inoculated into the lower animals.

Immunity against inoculation may be inherited or acquired. It is impossible to infect an individual (1) who is suffering from congenital syphilis (Profeta's law) (2) who is already suffering from the acquired disease (3) a woman who has borne a syphilitic infant but has herself shown no signs of the disease (Colles law). In the last case the mother is suffering from latent syphilis, which may give a positive Wassermann reaction and later show gummatous lesions.

We cannot at present exclude the possibility that immunity may be due to the persistence of an unrecognised developmental phase of the parasite

Pathology The treponema is the cause of many types of lesion, but three conditions may be taken as representative of the pathological changes.

The primary sore consists of a cellular infiltration, with swelling of the connective tissue elements. The epidermis is the seat of a leucocytic and fibrinous infiltration. The *perivascular lymph spaces* are intensely infiltrated with lymphocytes and plasma cells The vessels are inflamed, and the organism forms colonies in their walls, whence it passes by the vascular channels into the circulation and by the lymphatics to the nearest gland. The infiltration is slow to organise and the resultant scar is often inconspicuous.

The lenticular lesion may be taken as the type of the secondary manifestations. It consists of a *cellular infiltration*, especially plasma cells around the vessels. Occasionally giant-cells are present. The epidermis ma be unaffected, but in the scaly syphilides it is thickened, and in other forms œdematous and infiltrated, and it may undergo degeneration leading to superficial ulceration.

The gumma begins with venous thrombosis in the subcutaneous tissue. This i followed by excessive cell infiltration with round lymphoid and plasma cells and proliferating fibroblasts which may be rounded, irregular or spindle shaped. Endothelial cells and small giant-cells may be present. Degenerative changes lead to caseation, fatty degeneration and softening In all tertiary manifestations there is inflammation of the small vessels and thickening of their intima. Periarteritis is common.

Vegetating syphilides are produced by hypertrophy and infiltration of the epidermis ulcerative lesions by necrosis and destruction of the epidermis and of the true skin. The hardness of the lesion varies with the amount of increase of the connective tissue elements.

Clinical Tests for Syphilis

The demonstration of the treponema pallidum The surface of the chancre may be scraped, but better results are obtained by driving a fine pipette into its substance The serum thus obtained is placed on a slide with a few drops of normal saline solution and examined by the microscope (1/12 inch objective) by dark ground illumination The illuminated spirochætes are seen in motion crossing the field. Or the serum may be mixed with a drop of distilled water and a drop of Chinese ink, or as Harrison suggested a solution of Collargol (Collargol 1 Aq destillat. 19). A film is then made in the usual way by spreading the mixture with another slide and the preparation is then allowed to dry The examination is made with a twelfth oil immersion lens The treponemata are seen white against the dark background of the Collargol solution. The organism is about twice as long as the diameter of a red corpuscle.

Similar preparations may be made from fluid obtained by puncturing the primary bubo from moist papular and other lesions and from the bullous congenital syphilide.

The Serological Reactions in Syphilis

A large number of serological tests have been devised for detecting the presence of infection with syphilis, and these tests often afford a reliable confirmation of diagnosis At times negative results are just as useful to remove the suspicion that a lesion is syphilitic. Specific antibodies do not appear until some weeks after invasion with the treponema has occurred and these antibodies may persist long after clinical evidence of infection has disappeared Serological tests are helpful therefore in the early stage of syphilis to indicate when the infection has become general, and also in the later stage as a guide to the necessity for continued treatment.

It must be realised that these tests have not the accuracy of a chemical equation, and that there may be considerable variations in the delicacy of the reactions Tests should be sufficiently sensitive to permit the detection of slight degrees of infection yet without the possibility of a reaction with a non-syphilitic serum. The specificity of the tests may be seriously affected by small departures from an accepted technique or by slight variations in the antigens employed, and the need for a central authority to set a standard is generally realised. Divergence from accepted standards has resulted in incorrect positive Wassermann reactions, and has led to the institution of divorce proceedings and grave anxiety and unhappiness Probably more serious danger lies in the fact that an incorrect negative may lead to insufficient treatment, with the development of vascular and nervous complications, which may end fatally

Obviously it is advantageous to adopt the routine performance of at least two tests such as the Kahn and the Wassermann and, in a personal communication Dr E. J Wyler of the Pathological Laboratory of the Ministry of Health, stressed the essential advantages of the Wassermann reaction These, as Professor H Sachs points out, consist of clear cut results, reliability the fact that the test has been tried out in the course of many years and the circumstance that in some cases it alone reacts with a

syphilitic serum. The newer flocculation methods possess a definitely greater sensitiveness than the Wassermann reaction, and permit of the diagnostic recognition of a number of syphilitic sera with which the Wassermann reaction fails. These methods, therefore, fulfil a necessary supplementary function, though, for the reasons stated, they cannot replace the Wassermann reaction

To those whose duty it is to perform these laboratory tests the techniques devised by Dr Wyler will doubtless be familiar They are described —

(1) In a paper entitled "The Wassermann Test. Technical Details of No. 1 Method M.R.C. (Modified)," published by the Medical Research Council in 1929 Special Report series No. 129

(2) In a publication by the Ministry of Health (No 67) entitled, "A Method of Increasing the Sensitiveness of the Wassermann Test (1932)." In this improvement the sensitiveness of the older technique is raised about 20 per cent. by increasing the quantity of the patient's serum employed. This increase of sensitiveness is obtained without impairing its specificity 1,000 cases were tested, 433 syphilitic sera, and 567 "controls"

(3) In a third paper (Ministry of Health, No. 74 1934) he described methods by which serological tests may be made with very small quantities of the patients sera. These are of the highest importance in pædiatric work, where it is often impossible to obtain a quantity of serum from an infant adequate for the performance of the routine tests. The delicacy of these measures will be appreciated when it is realised that an efficient Wassermann test can be carried out with only 0·033 c.c. of serum. Similarly the Kahn reaction can be performed with accuracy with about 0·06 c.c., and the Rosenthal with about 0·05 c.c. The Meinicke micro-reaction requires such a small amount of serum that it might well be carried out as a routine parallel test in every case, however small the quantity available for the other tests

None of the four tests as described requires apparatus which is not readily available in any well-equipped laboratory Full details of the technique are given in Dr Wyler's papers.

The author concluded his observations by remarking that where the available amount of serum is very small, he would unhesitatingly advise the Wassermann reaction, and this can be accompanied by the Kahn whenever possible and always by the Meinicke micro-reaction. The Kahn, Rosenthal and Meinicke either singly or preferably in combination should be reserved for those occasions when speed is a paramount consideration or the Wassermann reaction is not possible.

He gave a warning that when only a minute quantity of serum is available it is worse than useless to have recourse to one test if the specificity of that test has not been established beyond reasonable doubt.

If a total of about 0·15 c.c of serum be available all four tests can be applied —

The Wassermann requiring	0·033 c.c. serum
The Kahn "	0·06 c.c. "
The Rosenthal "	0·05 c.c "

and the Micro-Meinicke an almost negligible quantity

the *Treponema pallidum* by dark ground examination *before* a chancre appeared.

The patient a student was able to point out the site of a small trauma which had occurred thirteen days before during coitus Charpy examined the woman and found her suffering from secondaries. At the urgent request of the student Charpy scarified the site of the healed trauma and in a drop of serum from it found treponemata Positive results were obtained daily in similar observations On the 24th day after coitus an oval superficial ulcer 4 to 5 mm in diameter appeared Its exudate was "teeming with treponemata Induration did not develop till the 28th day after infection when glandular swelling also appeared

In patients who have been treated by penicillin for gonorrhœa the drug may lengthen considerably the latent period of concurrent syphilis. Such patients should be watched for three months.

A second period of latency lasting five or six weeks follows the appearance of the chancre and then the symptoms of generalisation the so-called secondaries, appear They represent the reaction of the tissues generally to the organism brought to them by the blood stream These manifestations consist chiefly of lesions of the skin and mucous membranes, and occasionally of the nervous system. The reaction of the tissues does not destroy all the treponemata some are left in the backwaters of the vascular system where they may remain dormant. After a period of years, three or four to twenty or thirty some of these organisms become free and, reacting on already sensitised structures, produce a violent reaction similar to that seen in the "tuberculides (*vide* p 404) Thus we have the late **syphilides,** usually gummata in the skin, subcutaneous tissue, mucous membranes and viscera These manifestations are frequently called tertiary but there is often no dividing line between the stages From the practical point of view it is essential to distinguish the local (primary) stage and the stage of generalisation It must, however be recognised that in the late syphilides treponemata are sparse and that in this stage it is acknowledged that the patient may be considered as no longer in an infectious state The nervous phenomena known as parasyphilis—tabes, general paralysis of the insane and diseases of the great vessels, are undoubtedly due to the treponema pallidum in the central nervous and vascular systems and they can no longer be considered a special stage of the disease

Natural history of syphilis. The most important contribution to the natural history of syphilis is Bruusgaard's enquiry into the fate of the patients of César Boeck of Oslo published in 1929 Boeck held that mercury and iodides merely removed the symptoms of syphilis and from 1890 to 1910 he gave his patients no *specific* treatment. During this period 2 181 patients were under his care for syphilis In 1923 Bruusgaard undertook the colossal task of tracing their fate and was able to follow up 471 Wherever possible the living patients were thoroughly examined, particular attention being paid to the cardio-vascular and nervous systems The details are too voluminous to be set out here but it will suffice to say that surprising results were obtained. 200 out of 307 living patients showed no sign of syphilis at the examination 68 of these had positive serum reactions as the only evidence of previous lues Cardio vascular affections were found in 62 of the 471 patients among them 8 cases of

aortic aneurysm. General paralysis was found in only 0·6 per cent., and tabes in 3 per cent. It should be mentioned that Bruusgaard obtained reports on 164 individuals who had died. The paper is worth careful study

Earl Moore estimated that about one quarter of all luetics were prone to develop lesions of the cerebro-spinal or cardio-vascular systems. In the majority of these the general course of the infection is usually mild (*cf* Mott's observations, p. 521). In about another quarter there is little or no evidence of nervous or vascular disease but the subjects are likely to develop gummata of the skin, viscera or bones. In about one quarter there are no symptoms but only serological evidence of syphilis. The final 25 per cent. tend to spontaneous cure.

Against these estimates we have Warthin's classical observations on the latent lesions of syphilis in which he showed that histologically there was no cure of the disease. It is now suggested that there were special local reasons for so grave a view of the outlook to treponema infection.

The Primary Sore

The Chancre (Lat. cancer crab hence canker and Fr *chancre* sort of ulcer) appears at the site of infection. A breach of the surface appears to be necessary the organism making its entry through a crack, fissure a herpetic lesion, or a soft sore. Sexual intercourse kissing and medical examination are the commonest modes of infection Contact with contaminated cups, towels, and the like are occasional causes.

The primary sore is usually single, but multiple chancres (two or three) are not uncommon. Before the general infection occurs, auto-inoculation may cause successive chancres.

The commonest type of primary lesion is the *erosive chancre* a superficial erosion with a moist and finely granular surface, often of a greyish colour Next in frequency is an *ulcer* with a similar surface A third type is a purplish-red swollen œdematous prepuce through which can be felt an indurated plaque—a *sub-preputial* chancre. Less frequently the primary lesion is a well-defined red *papule* often with a moist surface. The rarest type is an ulcer at the meatus urinarius, the *meatal chancre* The primary sore is rarely larger than 1 cm. diameter when it occurs on the genital organs. The base is indurated and when taken between the finger and thumb the lesion feels like a piece of cartilage. The primary sore may disappear in ten days to six weeks, but occasionally it lasts much longer Very rarely as Sir Jonathan Hutchinson pointed out, a gummatous induration may reappear *in situ*, after the lapse of two or three years (chancre redux)

Chancres vary very much in their appearance and size, especially the extra-genital, which are often much larger and sometimes ulcerated. Chancres on the mucous surfaces are usually ulcerated when they come under observation.

Occasionally a soft sore appearing three to five days after exposure to infection becomes indurated three to five weeks later This is due to infection with *hæmophilus Ducreyi* and the treponema simultaneously or within a few days. Other complications of the primary sore are herpes,

We have no reliable figures as to the relative frequency of extra-genital chancres but estimate it at less than 5 per cent Of 141 adult males in the London Hospital clinic, extra-genital infection was known to have occurred in 3 3 per cent Of 136 adult females extra-genital infection was known to have occurred in 11 per cent This proportion is too high, as many women do not show signs of syphilis till the tertiary stage Finger gave the proportion in several European clinics as follows —

	Genital	Extra-genital.
Austria—males	94	6
females	86	14
Sweden	84	16
Balkan States	50	50

Czarist Russia gave remarkable figures We again quote Finger —

Government of Vladimir	9	91
Rjasan	26	74
Kursk	8	92

Extra-genital Infections in the Near East. Prof E von Düring who was syphilologist at Constantinople and Inspector-General in North west Asia Minor from 1889–1902 found syphilis an endemic disease conveyed by extra-genital infection. Genital sores were exceptional The secondary manifestations were almost confined to children while tertiary lesions were found in adults. Two-thirds of the patients were examples of grave destruction of the nasal bones perforation of the palate severe bone and joint affection recalling the grave manifestation of lues described in the sixteenth century v Düring found this type of disease most common in small villages and rare in the large towns

"Bejel. Ellis Hudson has studied a variety of syphilis resembling that described by v Düring occurring among the Bedouin Arabs in the Upper Euphrates valley It is also seen in Irak and Palestine under the names firjal" and "loath" Overcrowding and a filthy environment are causative factors Sixty per cent. of the population are infected before puberty and adults who escaped the disease in early childhood are often infected by their children Genital sores are rare It is generally agreed that the disease is not yaws, and Hasselmann protests against its special name

Syphilis d emblée or as Mr Ernest Lane used to describe it *crypto-genetic syphilis* is the name given to spirochæte infection in which the primary manifestation is unnoticed or inconspicuous. In two cases occurring in medical men the infection was caused by needle pricks at an operation. The initial lesions were so trivial that the sufferers, although trained observers, did not recognise them

The primary bubo is usually a single large indurated gland, but occasionally there are small shotty glands as satellites It appears about a week after the chancre, and persists long after it has disappeared. The syphilitic bubo does not suppurate Induration of the lymphatics along the body of the penis may be evident on palpation

Diagnosis of the primary chancre While we cannot insist too strongly that it is a serious matter to make a diagnosis of syphilis and condemn an individual to long expensive treatment at his own or the community's charge we are impelled to urge the importance of making an early decision. If we can say with certainty that a patient has contracted lues before his serum gives a positive reaction to one or more of the accepted tests we not

only afford him a good prospect of cure but the risks of his developing cardio-vascular lesions or involvement of the nervous system are minimal.

(a) *The history* may or may not be conclusive of the risks of infection. A number of individuals have syphilophobia and if they have exposed themselves to infection, fear the worst. It is not uncommon to be consulted by such persons three or four days after promiscuous intercourse with or without some local lesion, such as herpes. These patients require watching and a simple saline dressing should be ordered but *no antiseptic* until the practitioner has been able to make a diagnosis.

(b) *Clinical Examination* The diagnosis of primary chancre may be made with accuracy by inspection and palpation in a high proportion of cases by an experienced observer If in addition to the characters of the primary lesion, there is a definite indurated gland or glands the proportion of accurate diagnoses is increased. The following conditions should be borne in mind as somewhat simulating primary lues: (1) traumatic ulcer (2) herpes preputialis, (3) soft sore (4) recurrent induration at the site of an original primary (5) scabies, (6) erosive balanitis. The first three are distinguished by absence of induration, and ulcus molle is frequently multiple Recurrent induration probably gummatous, may lead to a suspicion of re-infection. Scabies lesions are common on the penis. There is much itching and a faulty diagnosis would be unlikely if a complete examination were made Erosive balanitis is not indurated. Other very rare conditions which have been mistaken for lues are epithelioma and lichen planus. In the former a biopsy would settle the diagnosis. In the latter the eruption is often on the accustomed sites (*vide* p 178) and on the buccal mucosa.

(c) *Laboratory Examination.* We advise this be undertaken in every case if possible The examination of a small quantity of the serum expressed from a sore perhaps after preliminary scarification, and its examination by dark-ground illumination, if positive is so definite that treatment may be begun at once. If there be the slightest suspicion such an examination should be repeated daily Until the observer is able to say with certainty that the patient has or has not lues, any lesion should be dressed as already mentioned with a piece of lint or gauze soaked in normal saline One of the serological tests should be made at an early date and repeated if negative or doubtful. If positive, treatment is started forthwith.

In a clinic where dark-ground examinations are made frequently we recommend that, if possible a special outfit should be permanently installed on the bench. This saves the observer much time in effecting the necessary adjustment of the apparatus and a suitable protection from dust can be easily provided. It is perhaps too much to expect every chancre to be examined by the dark-ground method though it is as advisable as that every fracture should be X rayed W cannot expect every practitioner to be expert Even if he ha the necessary apparatus it is still more important to be competent in the recognition of the treponema. We therefore advise the inexperienced to send thei patients a soon as possible to the nearest V.D centre taking care only to apply to the suspected lesion a dressing of normal saline It is obvious that in sparsely populated areas and many parts of the Dominions and Colonies the practitioner will have to rely upon his eyes and fingers and his clinical experience in the diagnosis of a primary sore

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Extra genital chancres are frequently not recognised because the condition is not borne in mind Finger sores may be mistaken for whitlow but any such condition in a medical man nurse or dentist should be examined at once for treponemata A case of ectothrix ring worm on the lip seen at the London Hospital clinic closely resembled an extra genital chancre Fungus was found by microscopical examination. Sequeira was once asked to see a woman with a secondary syphilitic eruption whose breast and axillary glands had been removed for a primary chancre of the nipple.

The Secondary Stage

Stage of generalisation. This begins from five to eight weeks after the appearance of the chancre

General symptoms There is often irregular fever and Sequeira once

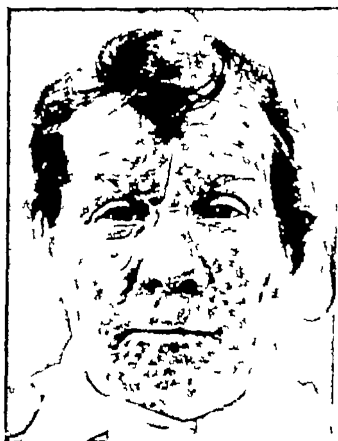


Fig 277 Lenticular syphilide

observed a pyrexia lasting for three weeks the chart closely resembling that of enteric fever The patient is anæmic and an examination of the blood shows leucocytosis. The lymphatic glands all over the body are enlarged, hard and shotty There may be enlargement of the spleen and albuminuria. The patient often complains of loss of strength and of wasting Headache and pains in the limbs, muscles and joints and neuralgia are common

Loss of hair iritis, and testicular inflammation may also occur Pregnant women often abort. The cutaneous and mucous membrane eruptions are numerous and important.

General characters of the eruptions :—

(*a*) *Polymorphism* The lesions are usually of several types For instance, macules, papules and scaly spots may coexist. But, although the type varies in different parts, or even in the same part, the size varies very little

(*b*) *Dissemination* The early syphilitic rashes are widely spread and abundant. They are prone to occur on the trunk, on the flexor surfaces



Fig. 278 Circinate papular syphilide.

of the limbs and on the central part of the face The palms and soles may also be involved.

(*c*) *Absence of itching* As a general rule, the eruption is unattended with subjective symptoms. Its onset is insidious, and itching is rarely noticed. It must, however be understood that this feature is not constant; the presence of some pruritus is not evidence against syphilis.

(*d*) *Character of the individual lesions* They are round, or tending to be round, and are often arranged in groups or rings. With the exception of the early macular eruption or roseola they have a reddish-yellow raw ham, or coppery colour They disappear spontaneously and often recur

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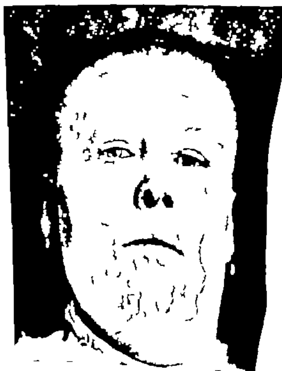


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Infiltration is a characteristic of many syphilides.

Special characters of the early eruptions (*a*) The **macular syphilide** is the earliest manifestation, appearing about six weeks after the chancre and lasting for three weeks to two months occasionally recurring during the first year and sometimes later The eruption consists of rose-coloured, round, or oval spots rarely larger than a centimetre in diameter The margin of the macule is ill-defined there is no scaling and no itching The roseola appears on the chest, flanks back and abdomen on the neck and limbs and on the palms and soles It is exceedingly rare on the face.



Fig 270 Moist papular syphilide (condylomata).

The macules are occasionally circinate. The macular syphilide often escapes the notice of the patient and it may be missed by the medical attendant if the examination is made in artificial light.

(*b*) The **papular syphilides** take several forms They usually appear on the sites of the macules and both macules and papules may be present simultaneously or they may arise independently of the rose spots The eruption occurs in the first year and lasts for a month to three months sometimes longer The lesions may be scaly (Plate 40)

The **lenticular syphilide** (Lat *lens tis* lentil) is the commonest form of papular eruption The lesions are round, red or ham-coloured spots rarely coppery The surface is shiny and there is usually a narrow ring

PLATE 49



PAPULO-SQUAMOUS SYPHILIDE

Abundant eruption; the lesions are all about one size. The colour and scaling are characteristic.

PLATE 50



LENTICULAR SYPHILIDE

The lesions are abundant, ham-coloured, and all about one size. Fine scaling is seen at the margins of some of the spots.

[To face p. [illegible]]

of fine scales round the margin. The papules feel firm and give the impression of infiltration. The lenticular syphilide is usually abundant on the trunk and limbs, the face palms, and soles (Fig 277) (Plate 50).

The nummular syphilide (Lat *nummus* coin) consists of flat coin-like lesions about one-third of an inch to an inch in diameter The plaques are of a dull red colour and of a round or oval shape. They may be dry or moist, or covered with crusts. They occur on the neck and face and in



Fig. 280 Condylomata lata of vulva. (F T Burke.)





Fig. 281 Perianal condylomata. Four weeks duration. WR ++

the flexures The nummular eruption is commonly associated with the smaller papular syphilide

Condylomata (Gk. *kondylos* knuckle) are large moist flat papules They are found commonly about the anus and vulva. They are one of the most characteristic manifestations of syphilis. The exudate usually contains many treponemata In African women masses of these lesions are common about the genitals Defective hygiene, sweating and a warm climate favour their development. Condylomata may also form in the flexures and under a pendulous mamma (Fig 279).

Occasionally there is a ringed or circinate papular eruption It forms rings or part of rings (Fig 278), and occurs on the chin, neck, lips and about the nostrils, and occasionally on the vulva. The papules are firm,

small and covered with fine scales In the case illustrated (Fig 286) there were concentric rings The ringed eruption is particularly common in the American negro In Central and East Africa it is comparatively rare.

(c) **Follicular syphilides.** In this type the eruption is localised to the hair follicles The eruption appears from four to six months after the chancre and often co-exists with the papular syphilides It may last several weeks The lesions are miliary dull red spots somewhat pointed, and often capped with a dry scale at the pilosebaceous orifice They develop slowly and are hard to the touch In some cases the apex of the

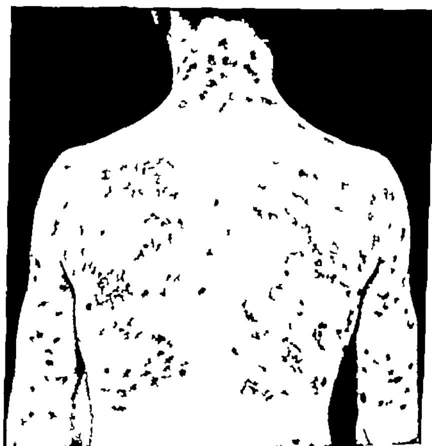


Fig 282 Papular and corymbose syphilide. The arrangement of the lesions should be examined with a lens.

follicle is capped by a small crust Sometimes the follicular eruption is **pustular** and the association of pustules and papules is not uncommon **(papulo-pustular syphilide)** The individual lesions are dark red in colour and covered with a pus-crust Various names have been given to modifications of the pustular follicular syphilides from their resemblance to other cutaneous affections *e.g* acneiform varicelliform varioliform vacciniform and herpetiform syphilides

(*d*) The **corymbose syphilide** (Gk *korumbos* cluster) (Fig 282) has special characters It consists of a central brownish red infiltrated papule about one fifth inch in diameter and arranged round this are numerous

papules the size of a pin's head, or a little larger. There may be several dozens of these small lesions forming a characteristic cluster around the central spot, which is sometimes covered by a scale or crust. The grouping

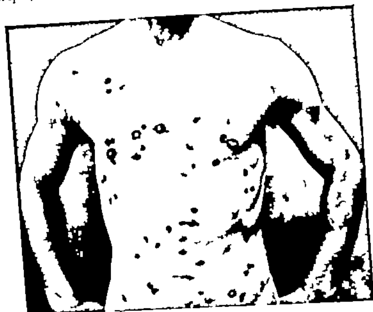


FIG. 283. Ulcerative syphilide.



FIG. 284. Late secondary syphilis.

is characteristic of syphilis, and the pigment stains which are left may last for several months and be of value in diagnosis.

(e) The **squamous syphilide** consists of rounded or ringed lesions of dull red colour covered with scales. The squames are less adherent than

those of psoriasis and the silvery character of the latter is absent. On their removal the papule is exposed, but there is no membrane of Bulkeley before the bleeding papillæ are reached, as in psoriasis. The squamous syphilide is also infiltrated, and this feature is valuable in the differential diagnosis. The eruption appears on the face, back, and neck, in the bends of the elbows and behind the knees. The fronts of the knees and the points of the elbows escape.

(*f*) **The crusted and impetiginous** *syphilides are moist flat papules of a* yellowish brown colour on which the exudation has dried to form crusts.



Fig. 285. Frambœsiform syphilide

On removing the crusts moist surfaces are exposed, but there is no ulceration as in rupia and ecthyma.

(*g*) The **vegetating (frambœsiform)** (French *framboise*, raspberry) **syphilide** is developed from the papule or pustule. It appears in the form of isolated plaques with fungating and papillomatous excrescences standing above the surface for perhaps a quarter of an inch (Fig. 285) and exuding serum or pus. It occurs on the scalp, neck, face, and chest, and sometimes on the palms. Its evolution is slow, and its disappearance is followed by staining. The frambœsiform syphilide is rare and apt to be sluggish in response to treatment.

(*h*) **Ulcerative syphilides. Rupia.** Ulcerative lesions are rare at this stage except in cachectic subjects. The more grave type occurs in those addicted to chronic alcoholism and in malaria, scurvy, diabetes, chronic renal disease and grave anæmia. It is often associated with extensive ulceration of the mucous membranes. The patient wastes to a remarkable

degree and in some instances pulmonary and renal complications supervene, leading to a fatal issue (syphilis maligna). The eruption is irregularly disseminated, the ulcers being sometimes numerous and coalescing, and in other instances few and widely scattered (Fig 283).

Each rupial lesion is a round or oval ulcer with steep sides and purplish margin, and a soft base exuding blood-stained pus, which dries to form a brown crust shaped like a limpet-shell It leaves a deep characteristic scar The rupial ulcer is rarely painful. The presence of the ulcer under



Fig. 284. Ringed syphilide.
(Similar lesions at bends of elbows).

the crusts is the diagnostic feature distinguishing this variety of syphilide from the massive crusts of psoriasis rupioides

(i) Palmar and plantar syphilides. The early palmar syphilide is usually macular affecting both palms, but occasionally the lesions are well-defined plaques or gyrate figures of a dull coppery red colour covered by a thick horny layer There is definite infiltration, and the margins of the scaly patches are surrounded by a zone of erythema. The later lesions are described at p. 545

(j) Pigmentary syphilides. A large number of syphilitic eruptions leave stains which may last several weeks to several months, the pigment in these conditions being derived from the blood, but there is a remarkable

pigmentary syphilide which is believed to be a true melanosis. There is some doubt as to whether it follows an eruption or if it is always independent. It occurs almost exclusively in the first two years after infection, but may last an indefinite time. It consists of greyish or brownish staining of the neck and is most abundant in the lateral aspects. The margin of the pigmented area is ill defined, but the surface is studded with white spots with a sharp outline, each spot varying in size from a split pea to a shilling. The dappled appearance is very striking and is characteristic of syphilis. This pigmentation occurs in women. It is exceedingly rare in men. The peculiar situation has led to the name of the "venereal collar" (Plate 51). The most striking anomalies of pigmentation seen in patients with syphilis are usually the sequel of arsenical medication (*vide* Fig. 208).

(*k*) **Syphilitic alopecia.** In the first year after infection the hair tends



Fig. 287. Syphilitic alopecia.

to fall. In most cases there is a general thinning, but in other instances there are patches of baldness depicted in Fig. 287. The areas differ from those of alopecia areata, resembling when viewed from the side glades in a forest, as certain authors have remarked. Stokes found syphilitic alopecia more frequent in white women than men. The condition is comparatively rare in the negro. In alopecia areata the bald areas are of round or ovoid form and quite smooth. In pseudopelade, which is sometimes simulated, the bald patches are cicatricial. Cicatrisation is met with in the alopecia left by favus and pus infection.

(*l*) **Affections of the nails. Onychia** (Gk. *onyx*, nail). Chancre of a nail fold may ulcerate and cause focal destruction of the nail plate. Onychia and perionychia occur in the stage of generalisation. In the former the nails are fissured, cracked and brittle (onychia sicca syphilitica) (*Fig.* 288). Sometimes the nail separates at the proximal end (onycholysis) and the

PLATE 31



I ML FAR SYPHILID

matrix is inflamed and swollen. More rarely separation begins at the root and progresses forward (onychomadesis), and the nail is shed. In other cases the nail plate becomes thickened and hypertrophied (onychauxis) and its surface irregular and discoloured. Ulceration and destruction of the nail may occur. In perionychia there may be scaly or inflammatory papules under the side of the nail or ulceration. The end of the finger is swollen and red, and the nail may be lost. The syphilitic affections of the nail are of slow evolution and attended with little pain, in great contrast to the whitlows caused by pyogenic infection.

Diagnosis of the early syphilides. It is unwise to make the diagnosis upon the character of the cutaneous manifestations alone although it may be done with certainty in many cases. In the male there is often the history of the chancre, and the scar may be observed on the penis. Earl Moore hazards the opinion that probably one male in five and one female



FIG. 288. Onychia sicca syphilitica.

in three suffering from syphilis may be unaware of a primary manifestation. The higher proportion of women is doubtless due to the frequency of chancre of the cervix uteri. In our experience extra-genital infections are not infrequently missed even when they occur in medical men, nurses and dentists. It must be remembered that the so-called secondary stage of syphilis is a general infection and the history of the development of symptoms must be carefully noted: the anæmic condition of the patient, nightly headaches, pains in the limbs, etc., will all be of value in diagnosis. The mucous membranes must be thoroughly examined, and often throw valuable light on the case. The glands above the bend of the elbow, over the mastoid, in the neck and groins must be palpated, and a general shotty enlargement will be strong evidence in favour of syphilis. The eruption is polymorphous; the individual lesions are round, or tending to be round, and except in the case of the roseola they are usually infiltrated; they are very much of one size though of different types; their colour is dull red, raw ham or coppery. They rarely itch. The characters of the various types of lesion have been sufficiently indicated in the preceding paragraphs.

Their association and order of development, first the rose rash, then the lenticular or papular eruptions are all important characteristics. It is a good general rule when one meets with a cutaneous eruption which does not conform to one of the common types to suspect syphilis and not to diagnose some rare condition until syphilis has been excluded. As Hutchinson long ago pointed out, syphilis is a great imitator but although the simulation of other diseases of the skin is very close there is usually some feature which leads one to doubt. For instance the scaly syphilide which affects the flexures may simulate psoriasis very closely but one is struck at once by the fact that the lesions are not in the common situation on the extensor surfaces. It is essential to investigate the condition of the mucous membranes and the glands, and to enquire into any antecedent rashes and their characters. If there is the least doubt a specimen of the blood should be taken and forwarded at once to the laboratory for the Wassermann, Kahn or Meinicke tests. *A positive reaction is obtained in nearly every case of secondary syphilis.* Again, one may be able by scraping the surface of a lesion for instance, a nodule or rupial ulcer to obtain fluid in which the treponema can be demonstrated by dark background illumination or by mixing with collargol and making a film preparation.

Failing these there is of course, the therapeutic test, the observation of the behaviour of the eruption under the influence of penicillin or salvarsan.

In practice the commonest skin affections which are diagnosed as syphilis are —(1) *Pityriasis rosea.* Thus is often mistaken *for the roseola.* The eruption appears on the trunk and adjacent parts of the extremities. The lesions are oval or lozenge shaped and also small round spots. They are pink in colour and are covered with fine scales. There is itching but there are no general symptoms and the mucous membranes and glands are unaffected. The syphilitic macular eruption is pink but it is never scaly. The scaly syphilides are infiltrated and of a dull red colour.

(2) Lichen planus is not infrequently diagnosed as a papular syphilide. The lichen spots are polygonal flat topped and shiny. They have a peculiar lilac or violet tint. *Itching is a prominent feature.* The fronts of the forearms and the fronts of the legs and thighs are usually first affected. The mucous membrane lesions are white papules or streaks or patches on the buccal mucosa and sometimes on the tongue and palate. There is no general enlargement of the glands.

(3) The seborrhœides are also sometimes mistaken for syphilis. The eruption consists of rounded spots or circinate lesions covered with greasy *scales.* There is usually a remarkable distribution in the middle line of the trunk, back and front, and associated with the trunk affection there is *pityriasis capitis.* The red areas covered with greasy scales may encroach upon the forehead from the hairy scalp producing the corona seborrhœica. There is no affection of the mucous membranes, and no general enlargement of the glands. Itching is often present.

(4) The scaly syphilides simulate psoriasis but they are generally in the flexures and infiltrated, and the scales are not of the bright silvery type characteristic of psoriasis. There would also be other signs of syphilis present. The two diseases may of course be present simultaneously. The rupioid variety of psoriasis is simply a severe condition in which

the scales have been allowed to accumulate Their removal shows minute bleeding points, and not an ulcer as in rupia.

(5) Scabies is not uncommonly diagnosed as syphilis. The presence of genital lesions, which are common in scabies, together with a widely spread eruption, is the cause of this error The mistake should be rare, because intense nocturnal itching is characteristic of scabies. The diagnosis is made by the presence of burrows and demonstration of the sarcoptes.

(6) Papulo-pustular syphilides of the face and head in the adult are not uncommonly diagnosed as impetigo both in civilian and military practice.

(7) Acne vulgaris is closely simulated by some of the follicular syphilides. The presence of comedones and early suppuration are important points in the diagnosis. The difficulty arises in some bad cases of acne vulgaris of the back where there are numerous infiltrated spots with much scarring As a rule there is a long history and many large comedones. Acne, of course, may coexist with syphilis.

(8) Pustular ringworm (kerion) of the beard region simulates the frambœsiform syphilides. The diagnosis is made by finding the fungus in or around the hairs.

(9) Certain drug eruptions sometimes give rise to difficulty The copaiba rash was one, but the drug is supplanted by the sulphonamides in the treatment of gonorrhœa. The presence of gonorrhœa may lead to the suspicion of simultaneous syphilitic infection if a drug eruption appears during treatment.

We have seen iodide eruptions diagnosed as syphilis, but the bullous or pustular and sometimes varioliform character of the lesions, their tendency to affect the face and neck, etc. (p 287), and the history of the patient taking a drug are helpful points. The presence of iodide in the urine can be demonstrated.

(10) The warty form of tuberculosis may suggest syphilis but its chronic course should rarely lead to error

Syphilis of the mucous membranes. Very few patients suffering from syphilis escape lesions of the mucous membranes They may occur about the mouth, on the lips tonsils, and pharynx, on the pillars of the fauces and on the gums about carious teeth, and in the nasal fossæ and larynx. The external genitals in both sexes may be affected, and also the anus The eruptions are most severe in patients of dirty habits, and in the chronic alcoholic In the mouth they are aggravated by smoking, by dental caries, pyorrhœa, etc.

Characters of the mucous membrane eruptions Erythema. The simplest lesions are red spots, which may be observed on the lips and palate. *Mucous plaques* are circinate, slightly raised swellings with swollen epithelium of a whitish colour but not ulcerated, closely resembling an area touched with the silver stick. They are the commonest lesions, and occur on the palate and also about the vulva. In some instances the spots are covered with a diphtheroid membrane *Erosions* are rounded, oval, or reniform superficial ulcers covered with a mucous secretion resembling the snail track Such ulcers often occur symmetrically on the tonsils. Hutchinson called attention to red, dry oval patches on the tongue. The disappearance of the papillæ gives these areas a peculiar " peeled " appear

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(3) The seborrhœides are also sometimes mistaken for syphilis. The eruption consists of rounded spots or circinate lesions covered with greasy scales There is usually a remarkable distribution in the middle line of the trunk back and front, and associated with the trunk affection there is pityriasis capitis. The red areas covered with greasy scales may encroach upon the forehead from the hairy scalp producing the corona seborrhœica. There is no affection of the mucous membranes and no general enlargement of the glands. Itching is often present.

(4) The scaly syphilides simulate psoriasis but they are generally in the flexures and infiltrated, and the scales are not of the bright silvery type characteristic of psoriasis. There would also be other signs of syphilis present. The two diseases may of course be present simultaneously The rupioid variety of psoriasis is simply a severe condition in which

ance They are rather a late symptom. Another form is the *condyloma* or moist papule which in dirty people may develop vegetations These occur in the vulval region at the angle of the mouth and in the gluteal cleft, the genito-crural flexures and on the tongue Condylomata about the genital and perianal regions are perhaps the commonest lesion in the dark races particularly in the women while secondary lesions on the tonsils and buccal mucosa are comparatively rare

Deep ulceration of the mucous membranes is rare in the secondary stage

Diagnosis of the mucous membrane lesions The points already mentioned in considering the diagnosis of the secondary stage apply here There are a few conditions to remember specially in considering the differential diagnosis Aphthæ are rounded, yellow painful superficial patches occurring on the gums and buccal mucosa The herpetic lesions of the mouth are also painful Neither of these conditions would be associated with a cutaneous eruption or shotty glands We have known erythema multiforme with extensive erosions in the mouth diagnosed as syphilis and treated unfortunately with mercury which aggravated all the symptoms The characters of the eruption of the extremities the absence of general gland enlargements and the common history of recurrences should obviate error Lichen planus is another condition which may be mistaken The buccal lesions are white spots patches or streaks and the cutaneous eruption is of a peculiar tint affecting the forearms and front of the legs It has already been considered in the diagnosis of the cutaneous eruptions (p 512)

Leukoplakia and exfoliative glossitis are unattended with cutaneous eruptions

The genital mucous membrane lesions have to be distinguished from the soft sore and from herpes The absence of general symptoms and especially of the shotty glands should prevent error In all cases the Kahn or Wassermann test should be used

Late or Tertiary Syphilides

The late manifestations of syphilis usually appear between the second and tenth years after infection but we have notes of several instances in which twenty years passed between the primary and the tertiary stages, and in one case thirty five years In quite 20 per cent of the cases of undoubted tertiary syphilis there is no history or evidence of previous symptoms. In women it is exceptional to get direct evidence, but a history of miscarriages was obtained in 55 per cent. of the married women with tertiary syphilis attending the London Hospital clinic In one case there had been eight miscarriages Many women who have borne syphilitic infants or who have had a series of miscarriages, present no cutaneous manifestations until the menopause is reached These late manifestations were more common in the female than in the male in the proportion of 61 to 39 per cent It would seem that this must be due to the fact that in the male the earlier stages are more often recognised and treated many women as already mentioned, having syphilis without symptoms. One-third of the cases both in women and men occur in the third decade of

life and one-fourth in the fourth decade. The limits of age in our cases were sixteen and eighty two years.

The late eruptions are usually of a localised type with considerable infiltration of the skin and subcutaneous tissues They are commonly asymmetrical, tend to break down into ulcers and leave scars or sclerotic conditions. Occasionally there is an erythema consisting of dark red or brownish-red non-infiltrated patches free from scales The lesions may be rounded or circinate. They occur on the trunk and the limbs and are rebellious to treatment. The tertiary erythema is distinguished from pityriasis rosea and from the seborrhoeic eruptions by the absence of scales, and from drug eruptions by the colour and the absence of irritation

The nodular tertiary syphilide consists of one nodule or a group of nodules of a reddish-brown colour The groups often form segments of circles. Such a group may be half an inch to three or four inches across. The individual nodules may be covered with scales or crusts, or they may break down into ulcers. On healing they leave some thickening of the tissues (sclerosis) or scars The eruption often closely resembles lupus vulgaris, but it is distinguished from it by its rapid evolution—a matter of several weeks—and the absence of the apple jelly nodules. The nose, forehead, and chin, the lower part of the neck and the upper part of the trunk, are the parts most commonly affected.

The gummatous syphilide (Lat. *gummi*, nature of contents) begins as a circumscribed induration of the hypoderm or of the cutis. At first the surface is unaffected, and the gumma is more easily felt than seen. The swelling varies in size from a pea to a walnut. It gradually enlarges and the skin becomes inflamed and reddened. The gumma then undergoes softening, the epidermis sooner or later gives way and a punched-out ulcer is formed. In some instances, however the lesion may clear up without undergoing this breaking down. The gummatous ulcer is characteristic the sides are steep, the base is covered with slough, often of a wash-leather colour and the discharge is sanious or purulent. Gummata are discrete or confined to regions, and are often grouped in a circinate fashion, a special feature being the polycyclic arrangement of circular or ovoid lesions (Fig 280). In rare cases the ulcer formed by the breaking down of a group of gummata is of considerable size several inches across with a festooned outline The scars left by tertiary ulcers are generally thin, with irregular edges, and their borders have the festooned outline of the ulceration. By taking the scar between the finger and thumb and approximating the sides, the cicatrix wrinkles up like soft tissue paper Hutchinson long ago described this as a characteristic feature but it is not peculiar to syphilis. In some cases the gummatous ulcer is associated with considerable thickening of the subcutaneous tissue—sclero-gumma (Plate 52).

Gummata may occur anywhere they are common on the face nose and lips about the mouth, on the scalp, trunk and extremities including the nail (Fig 282) They are often associated with similar lesions of the naso-pharynx perforation of the palate, and leukoplakia and ulceration and gummata of the tongue.

Palmar syphilides. These deserve special attention. They may be early or late manifestations. The early eruptions are macular and occur

PLATE 52



GUMMA OF BACK

Showing characteristic punched-out ulcer

(*b*) *Ringworm of the palm.* In this affection the margin is more inflammatory and very often vesicular and fungus is demonstrable under the microscope.

(*c*) *Psoriasis.* This is usually bilateral. The scaling is often excessive (compare Fig. 118). Both palmar and dorsal surfaces may be involved. The nails may be pitted, ridged or show subungual hyperkeratosis, and psoriasis will be present elsewhere, *e.g.*, elbows, knees and scalp.

(*d*) *Arsenical keratosis* is bilateral. In the thickened epidermis, embedded warty excrescences are found. There may also be pigmentation (rain drop) on the trunk. The history that the patient has been taking the drug would be elicited.

(*e*) *Lichen simplex chronicus* (Vidal) a neuro-dermatosis, may be localised to the palms (*vide* p. 175).

(*f*) The rare condition *acro-dermatitis perstans* may perhaps lead to error (*vide* p. 238).

A chronic scaly affection of the palm of one hand should always lead to



FIG. 290. Leukoplakia, with fissures.

a suspicion of syphilis, and the Wassermann reaction should prove of assistance in the diagnosis.

Among the rare tertiary manifestations, keratodermia (Gk. *keras* -*atos* horn) of the sole must be mentioned. It is found, as a rule, on one foot only. The epidermis is enormously thickened, generally of a yellowish brown colour and rough like shagreen leather. The hyperkeratosis extends all over the sole and encroaches on the sides of the foot. In some instances it is associated with elephantiasis nostras of the limb (Fig. 291). The whole leg is swollen and does not pit deeply upon pressure. The condition is believed to be due to lymphatic obstruction, but it is rare to find palpable enlargement of the glands.

A very rare tertiary phenomenon is a plastic induration of the corpus cavernosum—induratio penis plastica, in which osseous deposits may occur.

It is a noteworthy fact that enlargement of the lymphatic glands is

in association with or independent of the lenticular form already described. The spots are dull red in colour discrete, and vary in size from a pea to a bean. Both palms are affected

The late palmar syphilide is always unilateral and it occurs in three forms —

(1) Nodular or gummatous usually with a serpiginous outline, with or without ulceration

(2) The more important squamous eruption which may be circinate or diffuse which affects the middle of the palm The margin is usually



FIG 250 Gummatous syphilide with extensive scarring

sharply defined, the colour dull red, with adherent scale There is no itching

(3) A fissured hyperkeratosis of one palm or one sole is *a late manifestation* which may not be recognised as syphilitic It may last for ten to fifteen years *The differential diagnosis of these palmar eruptions* is often difficult. The following points require attention —

The early palmar syphilides are always bilateral, the later unilateral They may be mistaken for—

(a) *Erythema multiforme* of which the iris type commonly gives palmar lesions.

contrast to the slow evolution of the tuberculous affections, especially *lupus vulgaris* which is the commonest disease in which mistakes are made. Necrosis of bone and deep ulceration of muscle do not occur in lupus. Vincent's angina with extensive destructive ulceration has not infrequently been diagnosed as syphilitic. *Sporotrichosis* if not remembered may lead to error for one type of the lesions closely simulates gummata (p. 456). Squamous celled epithelioma, if actively spreading like a gummatous lesion early invades the lymphatic glands, and if there be doubt a biopsy should at once be made. It must, however be remembered that carcinoma may develop on a late syphilitic scar and also on leukoplakia of the tongue and buccal mucosa. The *rodent ulcer* should not be mistaken for syphilis its very slow evolution and the rolled edge are sufficient to make the distinction. When gummatous infiltration affects particular regions there may be some difficulty We have seen cases in which the lesions were confined to the beard region and the condition simulated *sycosis*.

A positive Wassermann reaction is obtained in about 90 per cent. of the cases of tertiary syphilis, and where there is any doubt the test should be



Fig. 293. Tertiary onychia.

made If the practitioner is unable to get the test applied, it is best to put the patient at once on anti-syphilitic treatment. In a couple of weeks many gummatous affections are so profoundly modified as to make the diagnosis certain. The mercuric iodide mixture is indicated.

Prognosis Provided the patient's *general health* is not undermined by general disease the tertiary syphilitic eruptions usually yield to treatment. Relapses are *frequent*, particularly in hospital practice, as it is difficult to keep the patients *sufficiently long* under treatment after the lesions have healed. There is no doubt that we rarely now see the terrible late syphilides which were common forty years ago

Variations in the Clinical Types of Syphilis. The clinical manifestations of syphilis vary not only with the *stage* of the disease but also apparently with race and climate It is normally endemic in most countries but from time to time has shown an epidemic character especially when it has been introduced into a virgin community Whatever view one may take as to the probability of there being a form of syphilis in the Eastern hemisphere before the visit of Columbus and his companions to *Haiti (Hispaniola)* in the last decade of the fifteenth century there is no doubt that a grave epidemic spread over a large part of Europe in the early years of the sixteenth century History tell us that the gravity of this type of syphilis rapidly became attenuated and that in from fifty to seventy-five years it had undergone remarkable modifications

exceptional in tertiary syphilis, and this point may be used in the differential diagnosis of gummatous from other forms of ulceration.

Diagnosis of the late or tertiary lesions. A thorough examination of the skin should be made for there will often be found evidence of syphilis in the shape of scars of previous lesions. Tertiary lesions of the mucous membranes are of great value in diagnosis. In 12 per cent. of Sequeira's cases there was leukoplakia of the tongue. Naturally there was a greater proportion of tongue lesions in the males than in the females on account



FIG 291 Syphilitic keratodermia with elephantiasis nostras.

of smoking but the worst case seen in his clinic was in a woman who had been a pipe smoker for many years. The development of cancer on leukoplakia must not be forgotten. Deep lingual glossitis a gummatous affection may occur. The pharynx should be inspected, and there are often indications of previous ulceration in the shape of scars adhesions or perforations. Fissures at the angles of the mouth with evident induration in an adult should arouse suspicion of old syphilis. In other cases an examination of the eyes will reveal irregularity of the pupil from old iritic adhesions or choroiditis. Tabes may very rarely be associated with gummatous ulcers.

The rapidity of the destruction in the syphilitic disease is in great

serological reaction. In many women, therefore lues may be a comparatively trivial affection, but the subject is not rendered immune from the transmission of the disease to her offspring or to others. These facts render it important that routine blood tests should be done in pregnant women

Central nervous and cardio-vascular infections are much rarer in women than in men.

The Influence of Age Elderly men not infrequently contract syphilis The need for intensive treatment with the object of preventing cerebrospinal lesions and involvement of the heart and great vessels is less imperative than in a young subject with his life before him.

The Influence of Other Diseases. The association of syphilis and tuberculosis is usually of little import, but intensive treatment of the former may have a deleterious effect upon the latter

The Influence of Race The American negro is more prone to folliculopapular and annular skin eruptions and condylomata are far commoner than in white subjects. Generalised adenopathy is more evident. In East Africa Sequeira found buccal lesions relatively uncommon. The American negro is more liable to bone and cardio-vascular affections. Vint and Webb and Holloway found aortic disease and aneurysm rare in Kenya and Uganda. Tabes is very rare in these countries but recently general paralysis is more often recognised. This also applies to North Africa (Sézary)

Sequeira and Gilks in an extensive survey of highly syphilised tribes in East Central Africa found evidence of congenital syphilis rare. Neither Hutchinson teeth nor interstitial keratitis were found in several thousand persons examined. On the other hand, abortions and miscarriages were common in these tribes and were recognised by the natives as being syphilitic The Masai, for instance took active quarantine measures to prevent the entrance of luetics into their districts. It would appear that provided the African infant is born alive a high degree of immunity to the later manifestations of congenital syphilis is developed.

The type of syphilis found in Asia Minor Irak, etc., already mentioned (p 530) is remarkably free from implication of the nervous and cardio-vascular systems; the clinical manifestations are chiefly in the skin and mucous membranes, bones, etc.

Modifications probably due to Treatment. In our own experience syphilis as seen in British clinics, has undergone important changes Undoubtedly part of this improvement has been brought about by earlier diagnosis and treatment. The influence of Hutchinson Fournier Finger and others did much to diffuse knowledge of the clinical aspects of this protean disease and the need for prolonged treatment. We see far fewer gummata, and less of the mutilations of the face of "lues hereditaria tarda." The old bone affections which were so prominent on the shelves of our pathological museums seem to have disappeared. Congenital syphilis, as we shall see should soon be eliminated

It is only right to mention that there was evidence of the attenuation of the syphilitic virus before the advent of salvarsan. Years of treatment by mercury and iodides doubtless played a part. Since arsenical medication has been employed, viz., since 1910 and the extensive opportunities for diagnosis and treatment started during the 1914-18 War there has been a rapid amelioration of the position Indeed, this is so evident that it is often not easy to find cases of secondary or tertiary syphilis for the instruction of students. These difficulties had also been found in Continental clinics before 1939

Indeed according to information obtained by Prof Jeanselme this attenuation was observed as early as 1508

What Gougerot calls Columbian syphilis was characterised by a florid and exuberant eruption with extensive ulceration and affection of the bones. Although the cutaneous and osseous manifestations were grave the disease does not appear to have affected the heart and great vessels and the nervous system to a high degree

In fact the phenomena described closely resembled the luetic affection met with in the primitive races On the other hand there seems to be good evidence that the Caribs probably from generations of infection presented symptoms of less severity

A good example of the epidemic character of syphilis when attacking a virgin community was shown in the outbreak which occurred in Uganda after the emancipation of the women from tribal restrictions in 1890 after the conversion of the chiefs to Christianity Ten years later the population was so gravely infected that in 1908 Col Lambkin was sent out to investigate and advise as to measures to deal with the situation Lambkin found that 80 per cent of the Baganda were infected and that there was a high incidence of lues in other races in the Protectorate

Great wars have always been attended by outbreaks of syphilis According to Ferguson Lisbon during the Napoleonic wars was the seat of a big epidemic

During the 1914-18 War there was again a great epidemic which lasted from 1914 to 1924 and followed the usual course of such outbreaks The peak number of infections was observed in 1920 Non belligerent countries as well as those engaged in hostilities were affected even as far afield as the Dutch East Indies The war of 1939-45 has also been attended by a large increase in the incidence of syphilis

We have already remarked that in the sixteenth century the grave type (Columbian of Gougerot) underwent a spontaneous change its severity becoming rapidly attenuated We have long thought that syphilis being primarily a tropical disease may undergo such a modification from climatic reasons In this connection it may be pointed out that epidemics of lues in Iceland caused by the introduction of the treponema by miners and into other northern islands by fishermen died out leaving the population free from syphilis (Touraine)

Two main clinical types of syphilis must be recognised The first with which we are more immediately concerned is that in which the chief manifestations occur in the skin and mucous membranes : This is the *dermatotropic type* The second chiefly attacks the central nervous system and is the *neurotropic* type Endeavours have been made to show that these variations may depend upon different strains of treponema but the evidence is not conclusive Further it has been pointed out especially by French syphilologists that where the brunt of the luetic infection falls upon the skin and mucous membranes such a reaction in some unknown way described as humoral protects the central nervous system It will probably be remembered that when Sir Frederick Mott did his early work on spirochaetosis of the brain he found that a large proportion of his patients had had syphilis in a mild form and that many had been diagnosed as suffering only from " soft sore or gonorrhoea It would thus appear that a significant proportion had not had marked cutaneous and mucous membrane lesions.

The Influence of Sex It has long been recognised that syphilis in the female between puberty and the menopause is a much milder disease than in the male There is reason therefore to believe that the female sex hormones are the factor diminishing the severity of the symptoms. It is also certain that pregnancy especially in early syphilis, has a profound effect. Should infection and conception coincide the early manifestations may be entirely suppressed the only evidence of the disease being a positive

The essential differences between the congenital and the acquired disease are the absence of the chancre and the mingling of the secondary and tertiary stages.

General symptoms. The infant at birth may be quite normal, and it may remain plump and well favoured for some weeks after the onset of the symptoms. In most instances, however there is a peculiar facies which is characteristic. The skin is of a dull earthy tint and shrunken, so that the face resembles that of a little wizened old man. As the disease advances the infant loses flesh rapidly

It is not often possible to demonstrate general enlargement of the lymphatic glands, but sometimes shotty epitrochlear glands are palpable In untreated cases visceral lesions may develop, particularly enlargement of the liver and spleen.

The earliest cutaneous manifestation is a bullous eruption on the palms and soles. The bullæ develop upon coppery or purplish spots, the epidermis being raised by clear or sanious fluid. The infant may be born with the eruption or with the remains of ruptured blisters, but, as a rule the lesions do not appear until four or five days after birth. Infants may occasionally be born alive with extensive areas of ruptured bullæ nearly all over the trunk and extremities. They may live a few hours or a couple of days.



Fig 201 Classical facies of pre-natal syphilis (saddle nose). (E. T Burke) (Reproduced by permission from the late Dr Tytler Burke's "Venereal Diseases.")

A constant nasal discharge of a serous or purulent character tending to form yellowish or greenish crusts, is a common phenomenon. The rhinitis, commonly called "snuffles," prevents nasal breathing and sucking is difficult.

Mucous patches occur about the commissures of the lips, where radiating fissures form. Sometimes they ulcerate and crusts develop upon them. The fissures may have an indurated base, and are attended with pain

Between the third or fourth week and the third month, rarely later a polymorphous eruption appears. It closely resembles the eruption of the secondary stage of the acquired disease consisting of rounded erythematous spots of a dark red or pink colour on the buttocks and lower limbs, about the mouth, on the neck and in the flexures. Some of these erythematous spots fade entirely but others become scaly or develop into papules Circinate lesions due to marginate thickening occur and in some instances the central parts become raised to form lenticular spots. Fine scaling is often present at the margin of the spots, but squamous patches are uncommon. Palmar and plantar bullæ may be present with the erythema and papules. *An important feature of the congenital syphilides is the tendency of the eruption to affect the palmar and plantar surfaces.*

We are just in doubt on one point and that is whether arseno-therapy may have contributed to an increase in nervous and cardio-vascular lues. There seems reason to believe that it has done so in primitive tribes inadequately treated. In the early part of this century von Düring found that of 80 000 syphilitics examined in Morocco there was no case of either general paralysis or tabes. More recently Sézary and others have found in the natives of North Africa a closer approximation of the type of syphilis to that in the European notably in the development of late lesions in the cardio-vascular and nervous systems. This is attributed to resistant strains of treponemata produced by inadequate treatment.

Congenital Syphilis

Congenital or heredo-syphilis is caused by the infection of the fœtus *in utero*. An early or severe infection kills the embryo and abortion occurs.



Fig 203 Congenital syphilis.

If the infection be less severe or later in the pregnancy the fœtus may survive. It may be born at full term with or without evidence of disease. It is generally accepted that congenital syphilis is of maternal origin and although the mother may show no clinical evidence of disease her Wassermann reaction is almost always positive.

An infant may be infected *in utero* before the mother shows evidence of infection. Reference has already been made to a woman who developed a primary sore three days after the birth of a child which was found three weeks later to be suffering from congenital lues (p 520).

It is however necessary to remember that an infant or young child may suffer from acquired syphilis. The treponema may be inoculated in the act of birth as in the cases of Eardley Holland and Lomholt, in which a primary chancre appeared in the site of an abrasion on the scalp of the new born infant. Chancres on the face and at the anus may occur in infants. In these cases the course of the disease is that of acquired syphilis.

In their later stages some of the lesions may become impetiginised and covered with crusts or they may pass on to ulceration. These changes are most common in parts liable to irritation and maceration from contact with urine and fæces.

The nails may be affected, and ungual and periungual inflammation may lead to a loss of the nails.

Condylomata (Fig. 270) are met with not infrequently in children who have long passed the polymorphic eruption stage. They are rarely seen before the sixth month or after the fifth or sixth year. *It is important to distinguish them from the ulcerating papular eruption of the napkin area described by Jacquet.*

Syphilis hereditaria tarda. Extensive ulcerations of the tertiary type in children between the ages of seven and twelve were at one time not



FIG. 203. Congenital syphilis. Hutchinson's teeth, interstitial keratitis with deafness. Extensive ulceration of the leg.

uncommon in our clinics. They were rapidly destructive and attacked chiefly the nose and oral region (Fig. 200). Gummatous swellings formed which rapidly broke down and, if not treated vigorously, caused grave deformity. In these cases the diagnosis of lupus vulgaris was commonly made. The process was so rapid that a great part of the nose might be destroyed in two or three weeks. The palate often suffered and extensive necrosis of bone took place leading to a large opening between the nose and the mouth. The pharynx and tongue might also be affected.

Thanks to early recognition and prompt treatment this type of case is now rare. It is certain also that antenatal treatment has greatly diminished *all types of hereditary syphilis.*

Other manifestations of congenital syphilis. The gummatous lesions just described are not the only *manifestations of heredo-syphilis.* It is important that others of diagnostic importance should be known to the clinician. They are here described.

"*Hutchinson's Triad*" is the name given to the co-existence of (1) A characteristic malformation of the upper incisor teeth (2) Interstitial keratitis, and (3) Nerve-deafness.

Dental Changes in Congenital Syphilis. The enamel of the upper central and lateral incisors wears badly and may show caries. Precocious eruption and also retarded eruption have been recorded.

"*Hutchinson Teeth.*" The upper permanent incisors are affected, usually on both sides. The lateral surfaces of the teeth converge producing a peg-shaped or "screw-driver" appearance. On the incisal edge there is a characteristic notch (Fig 295 and Plate 53). Less often the lower incisors show similar characters. There is often some spacing between the upper incisors (Plate 53). The X-rays show that the changes begin about birth and that the occlusal part of the teeth is smaller than normal.

"*Moon Teeth.*" These are less common than the Hutchinson type. The permanent first molars are affected. The proximal surfaces are constricted and the occlusal portion is one-third narrower than normal. The cusps are crowded together so that the surface has the appearance of a mulberry on a dwarfed crown.

Congenital absence of the teeth is said to be a rare occurrence in heredo-syphilis. It is far more likely to be part of a developmental defect.

Bone and joint affections in congenital syphilis These require attention because they are often valuable pointers to a correct diagnosis. The metaphyses of the long bones, and the sub-periosteal and periosteal zones and osteogenetic centres of flat bones are affected. In the first few months of life the earliest manifestations are *epiphysitis* (Wegner's osteochondritis syphilitica). The epiphysis is swollen and may separate. The process is painful and restricts movement and simulates paralysis. Suppurative arthritis may occur Imperfect ossification of the flat bones of the skull is next of importance. There may be gross rarefaction to "egg-shell" thinness or actual holes in the vault (*cranio-tabes*). Later bosses form on the rarefied areas by subperiosteal hyperosteosis, forming the so-called "*Parrot's Nodes.*" Associated with these may be premature closure of the fontanelles and sutures and a general thickening of the skull-cap.

Destruction of the nasal bones, secondary to involvement of the mucosa, leads to a characteristic saddle-shaped depression of the nasal bridge. (Fig 294). About the second year we may meet with a *syphilitic dactylitis* a painless fusiform swelling first of the proximal, and later of the distal, phalanges. The index fingers are most often affected. Adjacent joints and soft tissues escape though the skin may become tense and shiny

Between the ages of 5 and 12 *periostitis* and *endostitis* of the long bones, tibia, ulna, radius and humerus, may produce isolated nodal thickening or broadening of the whole shaft. The *sabre-shaped tibia* is the most conspicuous example of this type of lesion. (It also occurs in yaws.)

The clavicle sign This useful evidence of congenital syphilis is unrecognised by the patient. It is a visible thickening and enlargement of the inner third of the clavicle antero-posteriorly It is usually unilateral on the right side in right-handed people and on the left in the left-handed. The subjects in whom it has been recognised are from fifteen to thirty years of age The hypertrophy can be seen and palpated, and is demonstrated by the X rays.

PLATE 53



CONGENITAL SYPHILIS

Rapidly destructive ulceration (some weeks only). Scars of older ulceration of nose. Hutchinson teeth. Interstitial keratitis and choroiditis.

[To face p. [illegible]

eruptions is considered on p 205. The history of a series of miscarriages in the mother is of value as an aid to diagnosis. The gummatous lesions have to be differentiated from tuberculous affections, particularly lupus vulgaris. If it is remembered that lupus is essentially a chronic disease and that syphilis will cause as much destruction in a few weeks to a few months as lupus does in several years, the mistake should not arise. Sequeira had under his care a girl (Fig 296) who had been treated at a dispensary as a case of tuberculous peritonitis for two years, and in whom a rapid ulceration developed on the nose It was naturally thought to be lupus, and the



FIG. 296. Congenital syphilis, gummatous type. Girl, æt. 11 There was large perforation of the palate. The spleen and liver were hypertrophied.

child was sent for the Finsen treatment. There was already some necrosis of the palate and the destruction of bone excluded lupus The abdominal swelling was due to enlargement of the liver and spleen. The nasal ulceration healed in three weeks with mercurial inunction. Under prolonged treatment with mercury the liver and spleen contracted to normal limits but the girl who was observed for years was dwarfed and infantile. Congenital syphilities may give a positive Wassermann reaction for many years.

Prognosis of congenital syphilis. Where the infant is born with the bullous syphilide it rarely survives more than a few days, and the bullous eruption which appears about the fourth or fifth day is a grave omen. Infants thus affected rarely live The common type in which the eruption

Clutton's joints Over a somewhat wide age limit a chronic insidious *painless* effusion may affect one and later symmetrically involve *the larger joints* particularly the knees Clutton drew attention to this manifestation of congenital syphilis and its diagnostic significance The mobility of the joints is not affected and the effusion responds rapidly to treatment. A similiar condition is said to occur in tuberculous subjects

It may be mentioned that the rachitic skull shows frontal and parietal bosses but cranio-tabes is very rare The head is square-shaped, the face small and the closure of the fontanelles is delayed.

Relative frequency of congenital manifestations Prof Wile and his colleagues give statistics of their findings in 500 cases of congenital syphilis mainly in white subjects Of these 92 were under two years old; the rest may be classed as "Tardive"

Infantile cases :—

Skin eruptions		27 per cent
Snuffles		18 "
Saddle nose		4
Bony stigmata		38
Hypertrophy of liver and spleen		5
Splenomegaly	only	2 "
Neuro-syphilis		10

There was a positive serum reaction in every patient

In the "tardive" group :—

Eye affections (mostly interstitial keratitis)		59 per cent
Primary optic atrophy		3 "
Nerve-deafness		0 "
Saddle-nose		10
Hutchinson's teeth		31
Suggestions of Hutchinson's teeth in another		16 "
Bone lesions		20
"Clutton's joints"		2
Rhagades and other skin affections		8 "
Enlarged liver and spleen	only	5 cases

Serum reactions. Ninety per cent of the patients gave a positive serum reaction 27 per cent had a positive reaction in the cerebro-spinal fluid. In only 6 per cent was there a negative serum reaction in the parents.

The prevalence of lues hereditaria tarda in Wile's statistics is certainly higher than our experience would have suggested

REFERENCES— Dental Conditions. B C BARNAT and N G SHAW *Amer Journ Dis Child.* 1942, 64 771 Figures, radiograms and literature "Les Dystrophies dentaires de la syphilis hereditaire 1930 by L. LEBOURG Doin., Paris. Statistics. U J WILE, L. K. MUNDT *Amer Journ Syph.* 1942 26, 70.

Diagnosis of congenital syphilides. It is useful to remember that an eruption on the hands and feet of a baby is usually either syphilis or scabies The presence of burrows and the probable infection of the mother or other children will be points of importance in the diagnosis. The bullous syphilide has to be distinguished from the bullous impetigo of infants. The predilection for the palms and soles is an important feature In doubtful cases the treponema may be sought for in the fluid, and the Wassermann test should be made The polymorphous eruption associated with the peculiar facies snuffles, etc is of a coppery or ham-colour the lesions are not confined to the napkin region and usually extend down the limbs to the palms and soles The differential diagnosis of the napkin

life insurance societies. In many proposals no question is asked as to whether the proposer has or has not had syphilis, and doctors who specialise in insurance work hold that this information is best obtained by the medical officer at the examination. The practice of one of the large societies may be taken as representing the common practice. This corporation has the following regulations. No proposer who has had syphilis shall be accepted unless (1) he has been thoroughly treated to the best of present knowledge, and no symptoms have developed in the meantime; (2) several years have elapsed since the date of infection and treatment and (3) the proposer's physical condition, family history and habits are satisfactory. Even when these conditions are fulfilled an addition to the ordinary premium is demanded. This society also held that if a man acquired syphilis after the age of forty he was a worse risk than if he had been infected at an earlier age. We have seen no statistics supporting this view. Many specialists in insurance practice hold that premiums are unduly weighted for persons who have had syphilis.

Although Warthin from his pathological examinations insisted that syphilis was never cured, it is generally held that complete absence of symptoms and a persistently negative serum may be taken as satisfactory evidence of "cure" in cases of *early* syphilis adequately treated. The only absolute evidence of cure is re-infection.

There are two other points worthy of note. The first is that syphilis is usually a milder disease in women than in men, and there may be no symptoms until after the menopause; and secondly that it is very difficult and, in some cases, impossible to say what is adequate treatment and we know a large proportion of patients fail to reach it.

Prophylaxis of Syphilis

(1) For medical men, midwives, nurses, etc. Any individual who is obliged to handle cases of syphilis should wear rubber gloves especially if there be any abrasion or cut on the fingers. In the latter case Metchnikoff's ointment (*vide infra*) should be rubbed in *before* and *after* putting on the glove. A parturient woman should never be examined without inspection of the genitalia for condylomata (probably the most infective luetic lesions). If rubber gloves are not available washing with an effective antiseptic is imperative. For many years successful protection was afforded to the hands of the maternity nursing staff at the London Hospital by washing with a 1/2,000 solution of perchloride of mercury solution before and after contact with midwifery cases.

The Matron at the London Hospital kindly informs us that the present practice is as follows:—

(*a*) *Precautions taken by nurses in the wards.* Before the present war it was the rule that gloves were worn for vaginal examinations and delivery. Owing to rubber shortage at present gloves are only used for vaginal examinations but not for actual delivery. Disinfectant used for hands: Dettol, 10 per cent. For vaginal examination, Dettol cream, 30 per cent.

(*b*) *Precautions taken by nurses on the district* (*i.e.*, in patients' homes). During labour: Gloves only used for vaginal examination. Dettol cream, 30 per cent. as lubricant. For washing hands, Dettol, 10 per cent.

appears about four weeks to two months after birth is usually amenable to *specific treatment*, and the majority of the infants do well. That the congenital disease is curable is shown by the fact that patients showing indubitable evidence of hereditary syphilis may acquire the disease in adult life. This fact must be borne in mind in the consideration of the very rare cases in which hereditary lues is said to have been transmitted to the second generation.

General Management of Acquired Syphilis

Warning to the Patient Suffering from Early Syphilis

The patient should be warned that in the primary stage of the disease the secretion from the chancre is infectious and also any linen, etc. soiled thereby. In the secondary, generalised stage, every secretion is a danger to others—saliva, urine, semen, breast milk, the sweat and tears and even the skin and hair. The contagium may thus be conveyed by toilet articles, shaving utensils, towels, sheets and other bedding, pipes, indeed, anything that may have come in contact with the patient. (There are classical cases on record in which a glass-blower's pipe conveyed syphilis to an assistant who carried on the blowing.) Sexual intercourse must, of course, be forbidden, also sharing a bed and kissing (see Fig. 276).

The risk of infection from surface lesions and secretions in early syphilis has passed *forty-eight hours after the patient has received his third* injection of arsenic or second of penicillin, but even then it is *imperative that the patient should abstain from kissing, from sexual* intercourse and even from sharing a bed.

Marriage. It will be convenient here to discuss the question as to the marriage of syphilitics. In the first place it must be acknowledged that it is rare for an individual who has had syphilis to convey the disease to his or her partner after five years have elapsed since the date of infection.

If there have been sero-negative reactions throughout the courses of treatment and examinations of the cardio-vascular and nervous systems are satisfactory, marriage may be permitted after a year's probation following the cessation of treatment. We must here insist that the earliest primary lesion demands as active and continuous treatment as the secondary phase.

In other cases, if the serum reactions have been consistently negative when examined every three months over a period of two years *after all treatment has been stopped*, there is little risk in permitting marriage provided the cardio-vascular and central nervous systems are normal.

We are *strongly of opinion* that a practitioner would be well advised to have a consultation in every case before giving his consent to marriage. At the first and subsequent pregnancies the wife should have a blood test and anti-luetic treatment should be given without delay in the event of a positive reaction.

Life assurance and syphilis. In view of the fact that high authority asserted that "Syphilis is a killing disease," it is obviously of importance to

some quarters on an extensive scale. The arsphenamines are of doubtful value because they are excreted too quickly. Bismuth has proved more effective. Favourable reports of its regular employment in prostitutes have been received from Lodz in Poland and from Casablanca in Morocco.

Levaditi recommended stovarsol. On the first day following risk of infection 3 tablets (0·25 gramme) were taken.

On the second day 4 tablets.

On the third day 3 tablets.

This treatment was repeated after two to three days. It was discontinued on the appearance of a rash, gastro-intestinal symptoms, fever or the presence of urobilin in the urine.

Prophylactic measures for the general public. The common measures used in the prevention of contagious disease, viz., isolation and vaccination are not possible in the case of syphilis. The State, as advised by its experts, relies upon (1) education, and (2) free treatment of the infected under conditions of secrecy.

The most promising feature of the education campaign is that in Great Britain there has been an increasing number of persons who have run risks presenting themselves at the clinic for examination. A large and growing proportion of these have been found free from disease.

Prof. Stokes, of Philadelphia, however holds that a large part of the "didactic speech-making, lecturing and leaflet type of informative propaganda is ineffective." He points out that the first World War offered an unprecedented opportunity for testing the effectiveness of public education. Probably two millions of young Americans were taught the dangers of venereal disease and the urgent need for its early recognition. He found that the proportion of men who reported before the *tenth* day after infection was 2·4 per cent. in 1914 and in 1930, 4·3 per cent. The proportion who reported before the *fifteenth* day was 24 per cent. in 1914 and in 1930 35 per cent. Stokes remarks that at this rate of progress it would take 150 years to get every infected male to report early enough for successful treatment.

(2) *Free Treatment.* It is hardly conceivable that free treatment alone can rid the community of a contagious disease like syphilis. It is obvious that the large majority of syphilitics are unable to defray the cost of prolonged complete courses. Hence the State recognises that gratuitous treatment must be available. We now know for certain that early and adequate therapy not only shortens the period of infectivity but even ten injections of mapharsen greatly reduce the risk of infectious relapse. Our difficulty as doctors, is to ensure that every patient attending a clinic shall stay for the required course. Although the State, directly or indirectly pays for treatment it has not insisted by penal enactment on preventing defaulting. That a large proportion of the clinic patients attend regularly is due to the untiring efforts of the staff. There is, however a strong feeling that the hands of the clinic officers should be strengthened. In the Scandinavian countries, where notification of venereal disease has long been practised, the authorities are empowered to deal with defaulters from treatment. Immediately a patient fails to attend, the health authority is notified and police assistance can be invoked to compel attendance. As a matter of practice it is rare

During puerperium No gloves used. Dettol 5 per cent. for disinfecting nurses hands

If a syphilitic woman is accepted for confinement at home gloves are worn whenever the nurse attends the patient.

All cases with a positive serological reaction are automatically transferred to the London County Council (V D) Clinic and if requiring hospital treatment are sent to the special indoor clinic Syphilis cases can be accepted for home confinement if the Medical Officer in charge of the clinic gives his permission. On no account have cases been evacuated under the Government Evacuation Scheme for Expectant Mothers

Prophylaxis in the services Reliance is placed on (1) education (2) chemical or mechanical prophylactics, (3) early diagnosis and treatment, (4) quarantine and retention of leave and (5) recreation The educational part consists in lectures by selected medical officers at intervals The knowledge of the various methods by which disease can be prevented is conveyed to those who will not remain continent and who will run risks at any cost. Surgeon Commander Shaw R.N representing the Admiralty at the Imperial Conference at Wembley stated "The part played by suitable and immediate prophylaxis is no longer disputed by any responsible person While we all recognise the great importance of social measures in combating venereal diseases, we shall never exterminate them by this means alone My experience in the Service has convinced me that when prophylactic measures are properly used there is little risk of contracting the disease.

Sequeira s experience of prophylactic measures properly carried out in African soldiers entirely confirms Commander Shaw s opinion

The strong line taken in the United States Forces in the war of 1914–18, is summed up in the following terms by Colonel Hugh Young If a man came with venereal disease and said he had not used prophylaxis, the General because he had not used it punished him. As to the efficiency of prophylaxis we are absolutely agreed that it is wonderful in its efficacy if used properly There is no question about it. Prophylaxis is effective if used within the first hour and used rightly in certainly more than 80 per cent. of cases

Prophylaxis may be *mechanical* or *chemical* The properly made condom is as efficient as the surgeon s rubber glove If in addition, it be used with a chemical such as Metchnikoff's ointment, it is practically safe.

Chemical prophylaxis may be (1) external or (2) internal The treponema remains active on the surface for probably three hours. Any disinfectant will kill it The late Sir Archdall Reid, at Portsmouth in the last war showed that a 1/1 000 solution of permanganate of potassium was lethal to the parasite when applied to an infected surface. He had only 7 cases of infection in 20 000 recruits.

Metchnikoff's ointment Calomel 3 parts
Hydrous lanolin, 4 parts
Vaseline, 2 parts,

is still the best prophylactic for external use. It must be rubbed into all exposed parts within three hours of contagion

Internal chemical prophylaxis (Metallo prevention) has been used in

profound effect than chemotherapy alone. Indeed, in some clinics pyretotherapy has been used for the treatment of early syphilis as well as for the late nervous phenomena (*vide* p 582). The next step in arsenotherapy was to give small doses over long periods, *i.e., therapia sterilisans fractionata*. It was hoped by this measure to avoid a dangerous reaction in hypersensitive subjects. This practice was hastened by the pressing need for ambulant treatment which could be employed in the numerous venereal disease clinics which were established all over the country It would, no doubt, be advantageous to keep a patient at rest for twelve hours after an injection, but the safety of ambulant treatment as a routine measure has been established. The chief difficulty of these long courses is to prevent a patient defaulting Close co-operation between doctor and patient is essential for success.

Penicillin Therapy

The discovery that the *treponema pallidum* is vulnerable to penicillin has opened up a new chapter in syphilotherapy Experience in the



FIG. 297 Intravenous technique. Withdrawal of blood by Record syringe with laterally placed needle.

Services has shown that in the new drug we have a weapon which may supersede the arsenicals, for while obviously lethal to the organism, it has so far proved to be free from toxic effects on the patient. The complications of arsenotherapy especially intensive treatment, are not infrequent and some are dangerous to life. As the universal use of penicillin may not be possible for some time and its ultimate effects cannot be evaluated for at least five years we shall deal first with the treatment of syphilis by arsenicals and bismuth. Already some venereologists who have had experience of penicillin therapy advise using both remedies as a routine measure

Technique of intravenous injection. The urine being free from albumen the patient is given an aperient pill on the night before the injection and a saline draught in the morning It is best to avoid solid food for four hours before the injection.

for the police to intervene the fact that the doctor has this power behind him is a sufficient deterrent to the defaulter In some of our colonies this power is actually in existence but is never employed.

The best examples of the influence of treatment plus education are seen in the statistics furnished by Denmark and Sweden where notification is universal

Cases notified	All Denmark	Copenhagen.
1919	4 500	8,000
1933	700	200 (Lomholt)

It is held that in Denmark the figures for Copenhagen are not likely to be materially diminished, because seamen were constantly introducing fresh infection

In Sweden fresh cases notified were in	
1919	5,827
1932	771

Immediate prophylaxis or early treatment at centres is recommended by authorities in Great Britain It is also legal for chemists to sell prophylactic remedies but it is an offence punishable by law to give printed instructions as to their use.

Treatment of Syphilis

The introduction of 606 salvarsan by Ehrlich and Hata in 1910 was the beginning of modern syphilo-therapy Until then mercury was the drug relied on and iodide of potassium was used in the later stages.

Chemotherapy was expected at the outset to be a *therapia sterilisans magna* by which all the treponemata would be killed by one or two doses of the remedy injected intravenously The essential feature of the new therapy was the introduction into the circulation of a drug sufficiently potent to kill all the infecting organisms without subjecting the host to a dangerous risk The trivalent arsenicals in use fulfil these desiderata. To be effective they must be given in adequate doses for Ehrlich himself realised that such remedies administered in doses sub-lethal to the parasite might permit the survival of organisms which would become immune to the antibodies produced and lend to the development of strains "fast" or resistant to arsenic There is no doubt that the risk of producing such strains is a reality though it does not appear to be so common as in remedies used against the trypanosome The significance of these observations will be considered later

In the early days of 606 we saw some remarkably favourable results They may have been due to the fact that the preparation used was more potent than those now employed, but it must be noted that 606 was given after neutralisation in 300 c.c of sterile water In many instances the sterility was not absolute and it was the rule to find the patient half-an hour after the injection suffering from high pyrexia with rigors. That is to say he was subjected to pyretotherapy as well as arsenical chemotherapy It seems almost certain that the combination had a more

profound effect than chemotherapy alone. Indeed, in some clinics pyretotherapy has been used for the treatment of early syphilis as well as for the late nervous phenomena (*vide* p. 382). The next step in arsenotherapy was to give small doses over long periods, *i.e.*, *therapia sterilisans fractionata*. It was hoped by this measure to avoid a dangerous reaction in hypersensitive subjects. This practice was hastened by the pressing need for ambulant treatment which could be employed in the numerous venereal disease clinics which were established all over the country. It would, no doubt, be advantageous to keep a patient at rest for twelve hours after an injection, but the safety of ambulant treatment as a routine measure has been established. The chief difficulty of these long courses is to prevent a patient defaulting. Close co-operation between doctor and patient is essential for success.

Penicillin Therapy

The discovery that the *treponema pallidum* is vulnerable to penicillin has opened up a new chapter in syphilotherapy. Experience in the



FIG. 297. Intra venous technique. Withdrawal of blood by Record syringe with laterally placed needle.

Services has shown that in the new drug we have a weapon which may supersede the arsenicals for while obviously lethal to the organism it has so far proved to be free from toxic effects on the patient. The complications of arsenotherapy especially intensive treatment, are not infrequent and some are dangerous to life. As the universal use of penicillin may not be possible for some time and its ultimate effects cannot be evaluated for at least five years, we shall deal first with the treatment of syphilis by arsenicals and bismuth. Already some venereologists who have had experience of penicillin therapy advise using both remedies as a routine measure.

Technique of intravenous injection. The urine being free from albumen the patient is given an aperient pill on the night before the injection and a saline draught in the morning. It is best to avoid solid food for four hours before the injection.

for the police to intervene the fact that the doctor has this power behind him is a sufficient deterrent to the defaulter In some of our colonies this power is actually in existence but is never employed

The best examples of the influence of treatment plus education are seen in the statistics furnished by Denmark and Sweden, where notification is universal

Cases notified	All Denmark	Copenhagen
1919	4 500	8,000
1933	700	200 (*Lomholt*)

It is held that in Denmark the figures for Copenhagen are not likely to be materially diminished, because seamen were constantly introducing fresh infection

In Sweden fresh cases notified were in	
1919	5 827
1932	771

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Arsenotherapy

The commonly used arsenicals are trivalent. In B.P terminology they are (1) Arsphenamine (2) Neo-arsphenamine (3) Sulpharsphenamine, and (4) Mapharsen.

Arsphenamine. (Salvarsan, Kharsivan, "606"). This is a highly active arsenobenzol. Some authors hold that in spite of technical difficulties it is the best remedy in early and in resistant cases. Its great disadvantage is the necessity for neutralising the highly dangerous acid solution by caustic potash and the time occupied in introducing the large quantity of the solution intravenously. This is done by gravity or by the McIntosh Fildes pump.

Arsphenamine is dihydrochloride of dioxy-diammo-arsenobenzol. It is a canary yellow powder issued in sealed ampoules containing nitrogen. On exposure to the air it oxidises readily and becomes highly toxic. For injection it must be exactly neutralised by sodium hydrate. The maximum dose for the human subject is 0·01 gramme per kilogramme of body weight. For an adult the dose is from 0·2 to 0·6 gramme.

We are informed that the symptoms of poisoning by acid arsphenamine come on with "devastating rapidity". There is an immediate sense of oppression with pain in the chest. There are excruciating pains in the back, ashen pallor, syncope and circulatory collapse and perhaps death in a few minutes. Or the patient may feel nothing until he gets off the table when he may die suddenly as if from a blow. 0·2 gramme has proved lethal. Arsphenamine contains 31·6 per cent. of arsenic.

Neo-arsphenamine (Neosalvarsan, Neokharsivan, Novarsan, Novarsenobillon, Novarsenol, "914" Novostab, Rhodarsan, Stabilarsan). This remedy marketed under so many names is dioxy-diamino-arsenobenzene formaldehyde sulphoxylate of soda. It was introduced by Ehrlich in 1912. It is a yellow powder easily soluble in water the solution having a neutral reaction. It is issued in sealed ampoules, and is far more convenient than arsphenamine as it can be dissolved in 5 c.c. of distilled water and injected directly with a syringe. Neoarsphenamine rapidly oxidises in contact with air and by heat. The ampoule should, therefore, be opened at the time of the injection and the solvent should be cold. Care must be taken, especially in the tropics, to keep the drug in a cool place. Exposure to air causes the powder to turn an orange, then reddish, and finally a dark brown colour. The date of issue should be marked on the ampoule and no ampoule should be used if it be six months old. The solution should be clear yellow. If there be any abnormality in the colour the ampoule should be rejected for such changes mean that the drug has become highly poisonous.

Neoarsphenamine contains approximately 19 per cent. of arsenic. The maximum dose for the human subject is 0·015 gramme per kilogramme of body weight. The dose for an adult is 0·3 to 0·9 gramme.

Mapharsen (Mapharside arsenoxide) is meta-amino-parahydroxylphenyl arsine oxide. Ehrlich thought it too toxic for general use, but in its present form it is taking a high place in syphilotherapy. Tatum showed that it has a high spirochætocidal action and that its toxicity is low. Cruzhit and his collaborators gave over 0,000 doses. Its efficiency

The patient should be lying flat in bed or on a couch, with the arm chosen for the injection lying on a sterile towel The bend of the elbow is well washed and then cleansed with ether or acetone or painted with iodine. Round the thick part of the arm a tourniquet or bandage is fastened, the compression being sufficient to render prominent the veins at the bend of the elbow

If a small injection say 5 to 10 c.c., is *made it is injected with a syringe* with a fine needle, care of course being taken that the whole of the syringe and the needle are thoroughly sterilised. The Record syringe with the needle placed at one side is the most convenient, the lateral position of the needle permitting its entry into the prominent vein in a nearly horizontal direction The operator should withdraw the piston a little before making the injection. If blood follows the withdrawal it is certain that the needle is in the vein and the *tourniquet is then released. The injection is made* slowly and on the withdrawal of the needle the puncture is covered with a sterile pad and bandage

The novice should not attempt to use these highly concentrated solutions for if only a few drops are introduced into the connective tissue a severe reaction occurs This may be followed by extensive *sloughing* which may take four months to heal

The immediate subcutaneous injection of 1–2 c.c. of 10 per cent. sodium hyposulphite solution may neutralise the extra vascular arsenical and prevent serious necrosis

Technique of intramuscular injection. The needle should be 2 inches long of No 22 gauge fitted to an all glass syringe The site of injection is the junction of the outer and middle thirds of a line drawn *from* the anterior superior spine of the ilium to the top of the gluteal cleft. The area selected is thus free from danger of wounding large vessels or the sciatic nerve The needle separated from the syringe is inserted by a rapid stabbing movement at right angles to the skin deeply into the muscle. The syringe containing the solution is now attached to the needle and the piston is withdrawn a short distance to ascertain whether blood follows *If blood should appear it indicates that a blood vessel has* been hit by the needle which must then be withdrawn and a fresh site selected. The injection having been made the needle and syringe are gently withdrawn and the parts gently massaged. Massage by the patient subsequently is also useful At the time of injection the patient should either lie on a table with the arms hanging down or take up a *half standing* position with the glutei muscles as much relaxed as possible

Deep subcutaneous injection is probably more frequently used as there is less stiffness after the operation In this procedure the needle is not inserted at right angles to the surface but the skin and subcutaneous tissue over the muscle are picked up with the thumb and first finger *of the left* hand and the needle is inserted in a slanting direction *fairly close* to the surface. *As soon as the end of the needle is* felt to move freely in the subcutaneous tissue over the deep fascia the injection is made.

Sulfarsenol is the best preparation for intramuscular or hypodermic injections as it causes less pain than other arsenical compounds. *It* has been used with advantage in alternate doses with intravenous neo-arsphenamine (*vide* *p 380*) *It is not often necessary* to use it alone.

indicated by renal disease of non-syphilitic origin, by "renal inadequacy" by grave heart disease and hepatic cirrhosis.

Complications and dangers. The clinical phenomena which may attend or follow the intravenous injection of arsenical compounds are numerous and important.

Goulin's "Leucocytic Reaction." Goulin and his colleagues have shown that it is possible to forecast how an individual will respond to arsenical (and other) treatment by blood-counts. The white cell are counted at the time of injection and again *after two hours*. A favourable reaction to treatment is indicated by hyperleucocytosis. A leucopenia at the second count forecasts an unfavourable response to the particular drug used. In some cases a leucopenia after arsenic has been followed by increased leucocytosis with bismuth. We have had no experience of the leucocytic reaction but it might prove of service.

(1) *Pyrexia* is a common symptom, especially after the first injection in florid secondary cases. The rise of temperature begins two or three hours after the injection and lasts for twenty four hours. There may be mild rigors and headache. We have seen a temperature of 106·2° F. A rise to 100 to 102° occurred in 14 per cent. of the cases. The more severe symptoms may be due to some fault in the technique of water distillation but to-day the quantity used is only 5–10 c.c.

The Jarisch Herxheimer reaction is the term applied to an acute exacerbation of the disease usually in the secondary stage, which occasionally follows a first injection. Constitutional symptoms include malaise fever and aching pains and the local signs become more marked (*vide* 9).

(2) *Vaso-motor disturbances.* The blood pressure is always lowered for two or three days after the injection.

Nitritoid crises are vaso-motor disturbances which may occur during or immediately after an injection. They do not occur in continuous drip treatment (*vide* p. 580). The face becomes congested, the pupils dilate the pulse is rapid and may be dicrotic, the patient complains of constriction of the throat and precordial distress, sometimes accompanied by coughing. In some cases the face and tongue are swollen and there is severe dyspnoea with twitching of the limbs. In rare instances an acute *urticaria* follows. These phenomena closely resemble those seen after the administration of amyl nitrite, and they are also similar to the anaphylactic symptoms occasionally produced by serum injections. They are prevented and relieved by the intramuscular injection of 1·5 to 2 c.c. of adrenalin hydrochloride (1 in 1 000).

Syncope. Fainting during an injection is usually due to the taking of a heavy meal just before the injection, and is followed by vomiting. It may also be caused by fear. Injections should *always* be given with the patient recumbent. Adrenalin or coramine are useful restoratives.

A persistent slow pulse is sometimes seen after a course of injections.

(3) *Blood.* *Agranulocytosis and aplastic anaemia* are very rare complications of arsenotherapy. As in the condition which occurs with other drugs there is ulceration of the fauces, and at the first complaint of a sore throat in a patient under any of the arsphenamine drugs a differential blood count should be done. Neutropenia is the only reliable warning of impending agranulocytosis. It is believed that the benzol component of the arsphenamine group is the toxic factor. If recognised early and

equals that of arsphenamine and it is more effective than neoarsphenamine It has been in general use in the Royal Navy the Canadian and United States forces and in South African units The drug contains 20 per cent of trivalent arsenic *Mapharside is supplied mixed with a sufficiency of alkali and sucrose to make the aqueous solution isotonic with the blood.* The ampoules contain nitrogen and 10 c.c. of distilled water is sufficient to dissolve the contents The dose for an adult male is 40–60–75 *milli grammes* Ampoules showing discoloration should be discarded Curiously oxidation renders mapharsen less toxic

Sulpharsphenamine (Karsulphan, Metarsenobillon, Myosalvarsan, Sulfarsenol, Sulphostab) has a somewhat similar formula to 914 but sulphite of soda takes the place of the sulphoxylate It is used for intramuscular and subcutaneous injection Little or no discomfort follows such injections whereas both arsphenamine and neoarsphenamine injected intramuscularly may cause necrosis

It contains 10 per cent. of arsenic.

The dose for intramuscular injection for an adult male is 0·015 gram per kilogramme of body weight The adult therefore may be given from 0·3 to 0·9 gramme for a dose

A more rarely used trivalent arsenic is Silver salvarsan It is a brownish black powder soluble in water and gives an alkaline reaction The dose is 0 3 gramme for an adult. Galyl and Luargol are not now employed.

Pentavalent arsenicals. These are rarely used in the treatment of early infectious syphilis as their spirochætocidal action is much lower than the trivalent compounds Some of the members of the pentavalent group *e g atoxyl have been discarded because they* have a selective action on the optic nerves and may cause blindness Other cranial nerves may be affected.

Stovarsol. 3-acetylamino-4-hydroxyphenylarsonic acid is a stable compound containing 27 2 per cent of arsenic In the doses recommended it may be given by the mouth without irritating the alimentary canal It is prescribed in the form of tablets containing from ¼ to 4 grains It is marketed also under the names, *Goyl Orarsan Spirocid,* Stovarsolan

Adults may take from 2 to 4 four-grain tablets a day Tablets of ¼ grain have been used with success in congenital syphilis one to four such doses being given in a day

Stovarsol must not be given intravenously Stovarsol sodium a white powder soluble in water may be administered subcutaneously or by intramuscular injection The dose is 0·5 gramme in 2 c c of sterile water After the initial dose 1 gramme is given three times a week. As with all the pentavalent arsenicals the optic discs should be watched.

Tryparsamide. *N phenyl glycinamide-p-arsonic* acid. This pentavalent arsenical is not used in early syphilis but in the treatment of the late nervous phenomena. It is less toxic than other members of the pentavalent series but again, there is danger of optic atrophy The dose is 0·04 gramme per kilogramme of body weight One to two grammes are given weekly to adults.

Selection of cases. Treatment by these arsenical compounds is contra

easily be mistaken for that of scarlet fever It is followed by desquamation. The patients are seriously ill for a week.

An erythema which is usually morbilliform also occurs on the ninth or tenth day and is termed "*Erythema of the Ninth Day* (Milian). This eruption is probably a biotropic phenomenon and neither this nor the acute scarlatiniform eruption indicates intolerance to arsenic although further treatment should be given cautiously Desquamation is rare after erythema of the ninth day

REFERENCE.—GORDON, H., 1936. *Brit. Journ. Derm. & Syph.*, xlviii, p. 281
MILIAN G., 1920. *Ann. des Mal. Vén.* xv p. 436

Exfoliative dermatitis is one of the most serious complications of arsenotherapy It usually occurs after repeated doses (5 to 8) of neoarsphenamine (0·81 in 1 000 Moore). It is far less common with arsenoxide (mapharside) 0·053 per 1,000 The eruption may begin with pruritus, *i.e.* simple itching, of the extremities or (2) as a toxic erythema which is occasionally purpuric or (3) with a close simulation of eczema or (4) in the flexures as an eruption of seborrhoeic type. It spreads rapidly to every *part of the body and limbs and to the face which frequently shows marked* tumefaction Blebs and pustules form and their rupture and drying cause crusting and scaling In the flexures the sticky scabs and crusts are prominent features. Sepsis is common and multiple abscesses may appear The skin has a reddish brown colour and the epidermis is shed freely The itching is intense and the loss of sleep caused by the pruritus and general malaise affects the general health. In some cases, there is high pyrexia with diarrhoea. The tongue becomes dry and brown and the patient may pass into a typhoid state which may end fatally with or without lung complications. In severe cases the eruption may be haemorrhagic. Exfoliative dermatitis may persist for months. After an attack the skin may become quite clear or pigmentation may persist. Relapses are not uncommon For the incidence of dermatitis see p. 672

As soon as the condition is recognised or even suspected arsenotherapy must be completely stopped. If the patient is seen during the first seven or ten days the condition may yield to injections of sodium thiosulphate. The dose should be from 0·4 to 0·9 gramme and as much as 2 grammes may be administered in twenty-four hours. In any case, however vitamin C should be given, and is far more valuable than the thiosulphate after the first week Ascorbic acid should be given intravenously in doses of 500 mg daily for a week. We have seen good results from the use of British Anti Lewisite (B.A.L.) given in the early stages of arsenical dermatitis

The patient should, of course, be confined to bed and skilled nursing is necessary Every care should be taken against chilling the surface so largely deprived of its protective capillary control of heat loss The patient commonly complains of feeling cold. Plenty of fluid should be given and a light diet.

As a rule the eruption responds rapidly to the local application of a 0·5 per cent. water solution of either brilliant green or gentian violet. Itching is relieved and healing accelerated. In fact, one treats the denuded surface very much like a superficial burn. Bran baths are comforting.

promptly treated by pentnucleotide recovery is possible (*Ferguson J W (1941) Lancet i 331*)

(4) *Alimentary canal* *Diarrhœa and sickness* are moderately common. They may be severe and attended with colic and cramps in the limbs. Submucous hæmorrhages into the bowel wall have been found in fatal cases

Jaundice may cause some anxiety Though it is not a common complication there has been an increase in its incidence recently The Ministry of Health reported that of 131 000 persons treated in its clinics between 1931 and 1942 with two and a half million doses of arsenicals only 86 were ill enough from this complication to need admission to hospital.

Post arsphenamine jaundice may occur at any time during treatment. It may occur (1) in a usually mild form from six to fifteen days after injection, and (2) as delayed hepatitis about 100 days after A patient may have both the early and the delayed icterus. Delayed hepatitis may be of any degree of severity up to acute yellow atrophy It is indistinguishable from infective hepatitis There is no doubt that its occurrence in minor epidemics has been due to infection from one individual member to another by imperfect sterilisation of syringes used for intravenous injection

Stomatitis may occur during treatment by arsenic but is less severe than that due to mercury Ascorbic acid is of some prophylactic value

Vincent's Angina after Arsenotherapy A somewhat rare complication of arsenotherapy in syphilis is the development of Vincent's angina. This usually occurs eleven days after starting injections. The subjects have defective teeth and the edentulous escape The first symptoms are tenderness and bleeding of the gums Mastication and deglutition are painful and the stomatitis soon passes on to ulceration Spirochætes and fusiform bacilli are present in abundance The interest of the affection lies in the fact that the local application of neoarsphenamine rapidly cures the condition which itself appears to be caused by the systemic administration of the drug It would probably come into the group of Milian's "biotropism" While the local application of "914" gives good results complete cure can be effected rapidly by the application of a 10 per cent solution of chromic acid followed by two-hourly mouth washes of hydrogen peroxide (10 vols) It is advisable at the same time to give the patient 150 milligrammes of nicotinic acid daily As soon as the oral condition has cleared up intravenous injections of neoarsphenamine may be resumed Faulty conditions of the teeth should receive attention

(5) *Kidney* *Albuminuria* following an injection is uncommon but is to be regarded as a warning against increased dosage. The risk of renal complications appears greater in adults treated with intramuscular injections of sulpharsphenamine Partial or complete *suppression of urine* has occurred in a few instances In fatal cases hæmorrhages have been found into the kidneys, but the most constant features are cloudy degeneration of the glomeruli and convoluted tubules

(6) *Skin* *Urticaria* occurring with vaso-motor symptoms immediately after an injection has been already noticed *Pruritus* is not uncommon These are signs of intolerance and indicate caution as to dosage. They may precede dermatitis (*q v*)

Erythema An acute scarlatiniform or morbilliform rash may occur with high pyrexia (106 F) soon after the first injection The eruption might

bismuth oxychloride, metallic bismuth and bismuth hydroxide These are absorbed gradually and eliminated slowly They are therapeutically active and their injection is almost painless

(b) Insoluble preparations suspended in oil—bismuth-sodium potassium tartrate, metallic bismuth and the iodo-bismuthate of quinine. These are absorbed more slowly than the previously mentioned group. They are less active and from accumulation they are more toxic.

(2) Soluble preparations. Those dissolved in water are rarely used because they cause a severe local reaction and injections are very painful

Oil or lipo-soluble remedies, cardyl, bivatol, or embiol, have little toxicity and their injection is almost free from pain

(3) Bismarsen, a combination of bismuth and arsenic would theoretically appear to meet the requirements of syphilotherapy better than any of the other remedies This drug which is bismuth sulpharsphenamine has been found in practice to give less satisfaction than bismuth and arsenic administered separately and we do not recommend it.

With the intention of building up a depot from which bismuth is absorbed slowly and eliminated slowly we prefer an insoluble preparation, either bismuth hydroxide bismuth oxychloride or metallic bismuth. One of these drugs in doses of 0·2 to 0·3 gramme is given either by deep subcutaneous or intramuscular injection Intramuscular injections are given once or twice a week and a total of 2 to 4 grammes in a course of ten to twelve injections is usually well tolerated (*vide* p. 579).

The *technique of intramuscular injection* is described on p. 564

Clinical results of bismuth treatment. Treponemata disappear from superficial lesions in from five to six days. Primary and secondary manifestations clear up less rapidly than with arsenicals but more rapidly than with mercurial treatment. We have however found that mucous patches and other lesions on the tongue and buccal mucosa appear to heal more quickly in a patient taking bismuth, and we ascribe this to the fact that the drug is excreted in the saliva as the blue line at the gingival margin indicates.

It has been found that a total dosage of 1 gramme of bismuth will cause the disappearance of secondary eruptions.

Herxheimer reaction This occurs in bismuth therapy as after giving arsenic, but less frequently probably only in about one patient in five. It is important to note that jaundice caused by arsenotherapy is no contra-indication to the administration of bismuth. This is a great advantage as continuity of treatment may be maintained. As already mentioned some patients who are intolerant to arsenic are able to take the heavier metal without toxic reactions.

It is generally held that recurrences are more common in cases treated entirely with bismuth than in those where it is combined with arsenic There has been a tendency on account of the lesser risk of complications and the simplicity of intramuscular injections for practitioners to prefer the heavier metal. Gougerot strenuously warns clinicians not to become "Bismuth-minded."

Dangers of overdose It must not be imagined that bismuth is entirely free from toxicity Three fatalities were reported in Northern Rhodesia where a native formerly a hospital dresser injected in 2 cases 0·6 gm and in

six or eight weeks The encephalopathy mentioned above is not to be confounded with the Herxheimer reaction as it commonly develops after the second day

A Jarisch Herxheimer reaction may be more serious in late syphilitic disease The swelling of a gumma in a dangerous situation may be fatal coronary thrombosis has been recorded and paralyses of important nerves. In tabetics gastric crises and lightning pains may be provoked To avoid or mitigate this reaction the first injection of arsenic should be small or bismuth may be given first in the early cases and mercury and iodide in the later stages The Herxheimer reaction is thought to be due to the destruction of the organisms *in situ* with liberation of their toxins

Phlebitis and *thrombosis* in the vein used for injection may be due to faulty technique and carry some risk of embolism.

The considerations enumerated show the importance of care in the selection of cases and of scrupulous asepsis in the administration of the remedy

Earl Moore gives the following comparisons of the incidence of dermatitis *per* 1,000 injections with the different drugs in use —

" 606	0·9	per 1 000 injections.
914 "	0 81	
Bismuth	0 23	
Sulfarsphenol	1·39	
Silversalvarsan	0 52	
Mapharside	0 053	

It should here be noted that in all acute toxic reactions to arsenic B.A.L (British Anti lewisite) should be employed in the earliest stages of the reaction when it is most effective

Treatment by Bismuth

In 1921 Sazerac and Levaditi showed that bismuth is a valuable antisyphilitic remedy It acts more slowly than arsenic Treponemata disappear from primary and secondary lesions in about five days The organisms however have been seen by dark ground examination after three injections The chancre and secondary manifestations disappear less readily than with arsenotherapy but perhaps a little more quickly than with mercury alone

Bismuth has largely superseded mercury as an adjuvant to arsenic The heavier metals are given in association with the arsenicals with the object of forming a depot from which the drug is absorbed slowly In selecting a bismuth preparation preference should be given to one which

(1) is not too rapidly absorbed and too rapidly eliminated
(2) produces little local reaction and
(3) is nearly painless on injection.

Desiderata (2) and (3) are important because all bismuth preparations must be given either intra muscularly or by deep subcutaneous injection

On no account may bismuth be given intravenously

It is convenient to consider the available preparation in three groups (1) Insoluble preparations suspended in water or oil, (*a*) water suspended

rarely necessary to slit up the phimotic œdematous prepuce over a sub-preputial chancre, although this is frequently advised by surgeons. The swelling and phimosis rapidly subside after the first injection of mapharsen or penicillin. Ulcerated areas, whether of the secondary or tertiary stage, are dressed with lint soaked in black wash, or with "white precipitate" ointment. In phagedena of the penis we have obtained the best results from the use of an ointment of peroxide of zinc 20 to 40 grains to the ounce. A prolonged bath is also recommended in the treatment of this complication.

The initial positive sero-reaction may occur as early as the fifth day after the chancre appears or it may be delayed for a month. It has actually been observed before a "sore" was evident. Jeanselme avers that a positive reaction may usually be prevented if treatment is started before the 12th day and continued. In later cases the first or second injection may be followed by a fleeting positive about the 20th day

Infectious relapses. *The League of Nations Report* furnished some valuable information regarding infectious relapses (N.B. Before the advent of penicillin.)

(1) Relapses, whether serological or clinical, may be anticipated in 10·1 per cent. of the patients treated. One-half of these (*i.e.*, 5 per cent.) would be infectious.

(2) The proportion of muco-cutaneous relapses varied with the stage at which treatment was started. Thus —

(i) Sero-negative primary cases has 8·8 per cent. infectious relapses.

(ii) Sero-positive primaries 9·5 per cent. infectious relapses

(iii) Secondary syphilis had only 4·7 per cent. infectious relapses.

(3) 91 per cent. of infectious relapses occur during the first two years after infection.

In insufficiently treated cases the amount of arsenic given has a profound effect on the proportion of relapses.

Patients who received from—

1–4	injections (As) had	64 per cent. relapses.*
5–9	" "	14 " "
10–19	" "	4 " "
20–29	" "	3·6 "
30–39	" "	1·2 " "

* Only 10 per cent. were deemed infectious.

The critical point is evidently between the fifth and ninth injections.

In a base hospital for African soldiers patients were kept in the V.D. Clinic until this critical point was passed before being allowed to return to their units where they might, or might not, get further treatment.

The Effects of Treatment in Early Syphilis

The treatment of syphilis has to be considered from two points of view the communal or public health aspect and the individual aspect. The immediate objects on the public health side are the early recognition of the disease and the administration of adequate medication to render the surface lesions free from treponemata, and to prevent infectious relapses. Such

another 1·0 gm the subjects dying from grave buccal necrosis and acute nephritis

Untoward phenomena Bismuth poisoning resembles that due to mercury Symptoms of indigestion and headache are the earliest evidence There may also be loss of weight. Albumin in the urine demands suspension of treatment

The buccal mucosa is affected. Most patients show a greyish and later a blue line round the edges of the gingival mucous membrane. There may be actual stomatitis and infection with Vincent's organism. If stomatitis develops the drug must be stopped. Previous renal disease is a contra indication to bismuth therapy

Cutaneous eruptions are not common Exfoliative dermatitis has rarely been reported but there is a good illustration of such a case in the *Bulletin de la Soc française de Derm et de Syph* 1930 Lyons Section p 13

Severe lichen planus may occur after bismuth as after gold or arsenical injections and is generally followed by intense pigmentation It is no contra indication to further treatment

Pigmentation similar to that met with in argyria has been recorded when prolonged treatment by bismuth has been employed.

Articular pains Genner of Copenhagen called attention to the fact that patients undergoing treatment by this drug may suffer from arthralgia, resembling the pain of rheumatoid arthritis Usually more than one joint is affected. He found 3 5 per cent of patients taking bismuth affected in this way The pain ceases when the drug is stopped.

Arterial embolism is a serious complication It occurs if an artery should be blocked by the metal The rarer more severe type is known as *Dermite livédoide* (Nicolau) Benign cases are described as of the Freudenthal type

In a characteristic case the patient immediately the injection is made experiences a disagreeable sensation and if he has had previous treatments realises that there is something amiss Intense pain follows and the upper part of the buttock becomes increasingly swollen and tense The surface of the skin is marbled with greyish blue or violet spots with ecchymoses here and there The spots form an irregular network The affected area is limited to one side and is usually bounded by the anterior superior spine in front and a line adjoining the great trochanter and the sacro-iliac articulation below The swelling may increase for three days or more The pain and tenderness cause insomnia There is neither enlargement of the glands nor sciatic pain The affected area feels wooden and the patient may not be able to walk for a fortnight At the end of a month the livedo may have disappeared and with it the pain and tenderness No scar forms and at no time have phlyctenules been observed The X rays show numerous deposits of bismuth In the grave type described by Nicolau there was actual gangrene

Such an accident should never occur if the technique be correct and care is taken to insert the needle first and observe whether blood flows from it. As already mentioned if such occurs the needle must be withdrawn and a fresh site chosen for injection

Local treatment of syphilis of the skin is of minor importance but it is often a valuable adjuvant to the other measures The primary chancre may be dressed with dermatol or with orthoform or iodoform. The powder is dusted over the surface and a dressing of lint worn It is

rarely necessary to slit up the phimotic oedematous prepuce over a subpreputial chancre, although this is frequently advised by surgeons. The swelling and phimosis rapidly subside after the first injection of mapharsen or penicillin. Ulcerated areas, whether of the secondary or tertiary stage are dressed with lint soaked in black wash, or with "white precipitate" ointment. In phagedena of the penis we have obtained the best results from the use of an ointment of peroxide of zinc 20 to 40 grains to the ounce. A prolonged bath is also recommended in the treatment of this complication.

The initial positive sero-reaction may occur as early as the fifth day after the chancre appears or it may be delayed for a month. It has actually been observed before a "sore" was evident. Jeanselme avers that a positive reaction may usually be prevented if treatment is started before the 12th day and continued. In later cases the first or second injection may be followed by a fleeting positive about the 20th day

Infectious relapses. *The League of Nations Report* furnished some valuable information regarding infectious relapses (*N.B.* Before the advent of penicillin.)

(1) Relapses, whether serological or clinical, may be anticipated in 10·1 per cent. of the patients treated. One-half of these (*i.e.*, 5 per cent.) would be infectious.

(2) The proportion of muco-cutaneous relapses varied with the stage at which treatment was started. Thus :—

(i) Sero-negative primary cases has 8·3 per cent. infectious relapses.

(ii) Sero-positive primaries 9·5 per cent. infectious relapses.

(iii) Secondary syphilis had only 4·7 per cent. infectious relapses.

(3) 91 per cent. of infectious relapses occur during the first two years after infection.

In insufficiently treated cases the amount of arsenic given has a profound effect on the proportion of relapses.

Patients who received from—

1–4	injections (As) had			64 per cent. relapses.*		
5–9	"	"	"	14	"	"
10–19	"	"		4	"	"
20–29	"	"	"	2·6	"	"
30–39	"	"	"	1·2	"	

Only 10 per cent. were deemed infectious.

The critical point is evidently between the fifth and ninth injections.

In a base hospital for African soldiers patients were kept in the V.D. Clinic until this critical point was passed before being allowed to return to their units where they might or might not, get further treatment.

The Effects of Treatment in Early Syphilis

The treatment of syphilis has to be considered from two points of view; the communal or public health aspect and the individual aspect. The immediate object on the public health side are the early recognition of the disease and the administration of adequate medication to render the surface lesions free from treponemata, and to prevent infectious relapses Such

another 1·6 gm the subjects dying from grave buccal necrosis and acute nephritis

Untoward phenomena Bismuth poisoning resembles that due to mercury Symptoms of indigestion and headache are the earliest evidence There may also be loss of weight. Albumin in the urine demands suspension of treatment.

The buccal mucosa is affected. Most patients show a greyish, and later a blue line round the edges of the gingival mucous membrane There may be actual stomatitis and infection with Vincent s organism. If stomatitis develops the drug must be stopped Previous renal disease is a contra indication to bismuth therapy

Cutaneous eruptions are not common Exfoliative dermatitis has rarely been reported, but there is a good illustration of such a case in the *Bulletin de la Soc française de Derm et de Syph.,* 1936 Lyons Section p 13

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relapses may occur during the first two years after contracting the disease. What we have called the "individual" aspect of treatment is the endeavour to eradicate the disease and thus prevent the patient suffering perhaps many years later from cardio-vascular and cerebro-spinal affections which may prove fatal. Incidentally the object of both aspects of syphilotherapy is to render the patient free from the risk of transmitting syphilis to wife or husband or to an unborn child.

The valuable report of the experts appointed by the League of Nations demands our earnest consideration. The experts were from five countries—Denmark, France, Germany, Great Britain and the United States. From this report we gather the following facts. Under standard treatment of early cases (primary and secondary) thorough courses gave the following results :—

"Cures" in	Sero-negative primary cases	84 per cent
	Sero positive primary	64 3
	Secondary cases	81 5 ,,

It will be observed that sero positive primary cases show a lower percentage of "cures" than secondary cases. There seems, therefore, some advantage in well-developed muco-cutaneous manifestations. In some unknown way they appear to protect the central nervous system. It has even been held that a salvarsan eruption benefits the patient.

In syphilis the term "cure" is relative. The only certain test would be the contraction of a fresh infection. However we may sum up our conclusions as follows. Given adequate treatment in primary and early secondary syphilis nine out of ten patients are rendered free from infection, free from the risk of infectious relapse and run comparatively little risk of developing grave affections of the cardio vascular and central nervous systems in later life. One can perhaps go a little further and state that there is no doubt that a proportion of our patients will have been over treated. Even after over thirty years' experience of arsenotherapy we have no scientific criterion as to how much or how little of the drug is essential to effect a "cure." In fact we know less about this than we do about the use of the sulphonamides.

Sero-resistance. This requires study for it is the cause of great anxiety to the doctor and to the intelligent patient. Even among adequately treated cases of primary and early secondary syphilis a proportion of the patients continue to give a positive serum reaction or a negative produced by treatment may relapse to positive. We take the liberty of quoting figures given by Earl Moore and his colleagues in reference to this and shall include statistics referring to a later type of lues.

In *adequately treated* early syphilis serum resistance is found in from 5 to 10 per cent of the patients. In *latent* disease it is as high as 85 per cent. In *late muco-cutaneous* syphilides and in *meningo-vascular* lues serum resistance may be found in half the cases. In *general paralytics* it reaches 60 to 80 per cent. In *tabes* however persistent positives are found in only 10 to 25 per cent. (It is possible that some tabetics are not syphilitic but have been infected with the virus of lymphopathia venerea (p 638).)

We are well aware that many practitioners depend too much on laboratory tests, and we entirely endorse Earl Moore's dictum re intensively

sensitive tests "The serologist is more often responsible for sero-resistance than is the disease." We have always taught in our clinics the dangers of the regimentation of treatment, and the importance of the application of general medical principles in dealing with individuals, and we heartily support Earl Moore again in his advice to "Treat the patient and not his blood test."

Schemes of Treatment with Arsenic and Bismuth

The management of the treatment of a case of syphilis should, in our opinion, depend upon the special features of the case. Nowadays this is rarely practicable for the transference of the large majority of patients from the care of the practitioner to special departments of the public health service has led to the development of schemes of treatment which are believed to be sufficient (*a*) to render the subject free from contagion and (*b*) to prevent the serious danger of disease of the cardio-vascular system and of tabes and general paralysis.

The different schemes in use and the want of accurate knowledge of the results of modern treatment led in 1928 to the appointment by the Health Committee of the League of Nations of experts to collect and study statistics from five nations. No fewer than 94 clinics in Denmark, France, Germany, Great Britain and United States collaborated in the enquiry and more than 25,000 case reports were analysed. The colossal work of reporting on this mass of material was most carefully performed by Prof Martenstein, of Dresden, and the expert committee made a series of recommendations, which may be briefly summarised as follows —

(1) Treatment should be begun as early as possible, advantage being taken of dark-ground examination in sero-negative cases. Specimens from the lymphatic glands may be used as well as that from a sore

(2) Adequate physical examination must be made to determine the presence or absence of indications for care in the dosage

(3) A strict supervision of the patient is necessary during the treatment, special attention being paid to the mucous membranes, the skin, the kidneys and the liver

(4) Clinical and serological observation is required during the courses and for *three years* after the completion of treatment. Relapses, whether clinical or serological, are to be dealt with on the same lines as the original infection.

(5) An examination of the cerebro-spinal fluid should be made at the termination of the courses. This is far from universal in the clinics in the five countries.

The general principles underlying the administration of the drugs should be —

(*a*) To employ a comparatively heavy individual dosage of the arsenical and bismuth or mercury compounds, the doses being administered in comparatively rapid succession at the beginning

(*b*) To maintain a persistent attack, avoiding intervals of such length as to afford the parasite an opportunity of recovering

(*c*) To treat primary syphilis approximately as intensively as the disease in the secondary stage.

With regard to (*a*) and (*b*) Anwyl Davies found by watching the treponema that even during the first week the organism showed evidence of recovery from the initial dose He, therefore, and he is supported by other observers recommended two doses during the first week. These may be 0 3 gm and 0·45 gm. of 914 or one intravenous injection followed on the fourth day by an intramuscular dose of sulpharsenol (see below p 580)

The League of Nations experts did not find sufficient evidence to allow them to decide for or against a scheme of continuous treatment such as is commonly followed in certain American clinics An easily remembered formula was current in the United States, which provided a standard of adequate treatment It was 30–0–60–3 and its meaning was —

30 intravenous injections of an arsenical.
0 intervals
60 intramuscular injections of heavy metal, preferably Bi
3 years treatment and observation

With the experience gained during recent years there seems to be no doubt that the results of continuous treatment are better (though not much better) than those following intermittent schemes This later experience has also shown that there are advantages in using mapharsen (arsenoxide) instead of arsphenamine or neoarsphenamine. The amount of arsenic in mapharsen is far less than that in the other drugs Complications are fewer and *fatalities are rarer and the therapeutic results are quite as* satisfactory

Treatment of primary and secondary syphilis We give first the scheme *recommended by* Dr *Anwyl* Davies (1943) *which* with slight modification was adopted in a number of civil clinics and in the United States and Canadian Forces and in the British Navy and by the Union of South Africa At St. Thomas's Hospital Anwyl Davies had records of 45 781 injections given between 1936 and 1943 with only one death (from acute yellow atrophy) and no case of encephalopathy

The following precautions are advised during this course —

(1) The patient should not take a heavy meal for two hours before an injection
(2) A *prophylactic draught of glucose and liver is* given before each treatment Formula —

℞ Glucose 14 drachms.
Liq extract liver concentrated, 1 drachm.
Sodii bicarbonat., grs. 15
Ol limonis, 1 minim.
Water to 3 ounces

The draught is taken with 3 ounces of water
(3) Constipation should be avoided by a *mild* aperient
(4) Alcohol must be forbidden

Continuous Treatment with Mapharside

Week		Mapharside	Bismuth	
8	1	0·06 gm. 0·06 gm.	0·2 gm. 0·2 gm.	Blood test.
	2	0·06 gm. 0·06 gm.	0·2 gm. 0·2 gm.	
	3	0·06 gm. 0·06 gm.	0·2 gm. 0·2 gm.	
	4	0·06 gm.	0·4 gm.	
	5	0·06 gm.	0·4 gm.	
	6	0·06 gm.	0·4 gm.	Mist. Hydrarg. Iodid (p. 712.)
	7	0·06 gm.	—	" " "
	8	0·06 gm.	—	" " "
6	9 to 14	—	0·2 gm. *twice weekly*	
10	15 to 24	0·06 gm. *weekly*	—	Blood test. Mist. Hg. Iod. first 2 weeks.
8	25 to 32	—	0·4 gm. *weekly*	Spinal-fluid test ?
10	33 to 42	0·06 gm. *weekly*	—	Blood test Mist. Hg. Iod. first 2 weeks.
10	43 to 52	—	0·4 gm. *weekly*	
10	53 to 62	0·06 gm. *weekly*	—	Blood test Mist. Hg. Iod. first 2 weeks.
10	63 to 72	—	0·4 gm. *weekly*	
10	73 to 82	0·06 gm. *weekly*	—	Blood test. Mist. Hg. Iod. first 2 weeks.
10	83 to 92	—	0·4 gm. *weekly*	
	93	—	—	Blood test. Spinal-fluid test if possible

If negative blood-test should be performed every three months for twelve months and thereafter every six months.

If positive give bismuth, mercury and iodides for an indefinite period.

A minimum of twelve months continuous treatment after the patient is clinically and serologically negative is essential.

Intermittent treatment Some syphilologists hold that it is safer to follow the old practice of intermittent courses and the following scheme has given excellent results (Whitechapel L.C.C. Intermittent Course. Anwyl Davies 1935.)

1st to 5th weeks	Intravenous 0·14 0·45 gramme weekly On the third or fourth day after each of these 0·3 gramme sulpharsenol is given by deep subcutaneous injection 0·2 gramme of bismuth is given with each dose of arsenic
6th to 8th weeks	Mistura potassii iodidi grs xv to grs xxv by mouth thrice daily after food.
9th to 15th weeks	Course exactly similar to that given from 1st to 5th weeks

Three such courses are given with intervals of eight weeks between each. N B A total of 7·5 grammes of the arsenical and 4·0 grammes of bismuth are given in the thirteen weeks The prophylactic draught of liver and glucose (p 578) is given before each injection. The patient is weighed before each treatment and the urine is examined for albumin.

It will be realised that there is a greater risk of patients defaulting in the intervals of an intermittent course Touch might be kept with them by a weekly mercury injection or perhaps a placebo mixture

Intensive Treatment of Syphilis

Although there will still be many practitioners who will prefer to carry out the prolonged courses of arsenic and bismuth described war conditions deepened the interest taken in intensive treatment It is obvious that courses running to eighteen months or a couple of years were unsuitable for military patients and though there is necessarily a somewhat increased risk in intensive arsenotherapy it was deemed worth running on account of its other advantages We feel sure that penicillin therapy will now supersede these more dangerous measures

There are several schemes of treatment to be considered —

(1) Massive dose arsenotherapy by continuous intravenous drip
(2) Multiple intravenous injections at short intervals. (a) Daily injections, (b) tri weekly injections, bi weekly injections.
(3) Single injection with pyretotherapy

For all these measures the drug of choice is mapharside

(1) *Massive dose arseno-therapy by intravenous drip* Four to five-day course. This measure has been largely employed in certain hospitals in the United States and the results were so encouraging that the Commissioner of Health of the City of New York appointed a representative committee to organise and supervise extensive trials.

The course extends over four to five days and occupies ten hours each day A 5 per cent solution of glucose is given by intravenous drip slowly at the rate of 2 to 3 c c per minute At the start 100 c c of the dextrose solution is given and to it every hour is added 50 c.c containing 24 milli

grammes of mapharside The patient thus receives 240 milligrammes of the arsenical daily

Treponemata disappear from chancres within twenty four hours primary and secondary lesions clear up rapidly The Kahn and Wassermann serological tests, if positive, become negative, but this may not occur until three months have elapsed. Permanent reversal of a positive serum reaction is to be expected in a large majority

No nitritoid crises are seen with the drip treatment. A febrile reaction is almost always induced. A high proportion of the patients present a primary Herxheimer reaction and a large number develop scarlatiniform and morbilliform eruptions. Jaundice is rare. Polyneuritis occurs in about 5 per cent. of the cases but usually clears up without trouble. *The one risk is encephalopathy*

The success of the "drip treatment" is held to be due to the avoidance of "speed shock." (It has always been taught that nitritoid crises are more frequent if intravenous injections are given too rapidly)

(2) *Daily multiple intravenous injections of mapharside* H. Gordon and C. K. O Malley have used this measure at Cape Town. They gave intravenously five doses, each of 2 milligrammes of mapharside every two hours during a period of five days At the same time 25 ounces of a 10 per cent. solution of glucose was given by the mouth. Kvittingen, of the Royal Norwegian Navy has carried out treatment on similar lines. The advantage of these shortened courses in naval personnel is obvious and O'Malley found it of great service in men of the mercantile marine during short stops at the Cape.

By this intensive treatment treponemata disappear in less than twenty-four hours and cutaneous and mucous membrane syphilides rapidly resolve A course recommended is as follows —

8 a m.	Half an ounce of glucose in water orally
10 a.m.	0·02 gramme mapharside intravenously
11 a.m	Half an ounce glucose orally
12 noon.	0 02 gramme mapharside
2 p.m.	Half an ounce glucose.
3 p m.	0 02 gramme mapharside.
5 p.m.	Half an ounce glucose.
6 p.m.	0 02 gramme mapharside Five days treatment only

Warning Although from many quarters reports of the successful treatment of syphilis by massive doses of arsenic have been received many high authorities hold that they introduce a risk which should not be run in an average clinic As yet we have no means of preventing the grave accident of encephalopathy

Other schemes of intensive treatment.

(i) By artificial fever arsenic and bismuth.

(ii) Short term multiple syringe treatment by arsenic and bismuth.

(iii) Long term multiple syringe treatment.

Penicillin therapy is likely to make these methods obsolete.

It must first be insisted that every care should be taken in the

selection of the patients A complete examination must be made of the pulmonary and cardio vascular systems the chest X rayed and the electrocardiograph used blood counts, sedimentation time complete urine analysis and the icterus index should be included Lumbar puncture is also done in certain clinics but we are doubtful if that be wise or necessary as a routine measure

(i) *Treatment by artificial fever and arseno-bismuth therapy* Pyretotherapy for eight hours at 106 F rectal temperature. 1 76 milligrammes of mapharsen per 1 kilogramme of body weight are given in three equally divided doses intravenously The first dose is administered when the patient's temperature (rectal) reaches 106 F the second dose is given three hours later and the third dose at the fifth hour of maintained fever (Total mapharside for average adult is 180 milligrammes as the maximum dose)

One hundred and fifty milligrammes of bismuth element (2 c.c of bismuth salicylate in oil) are given intramuscularly within twenty four hours of starting the fever The patient is discharged on the third day after the end of the pyretotherapy and is seen weekly until two consecutive negative serum reactions are obtained The case is then followed up in the usual way

Pyretotherapy may have to be discontinued on account of —
(1) Lack of co-operation by the patient.
(2) Persistent mental confusion
(3) Cardio-vascular fatigue
(4) Persistent nausea vomiting abdominal cramps.
(5) Great bodily fatigue
(6) Convulsions.
(7) Mechanical defects of apparatus.

(ii) *Short term multiple syringe arseno-bismuth therapy* (One week.) 80 milligrammes of mapharside are given twice daily intravenously for six or seven days 150 milligrammes of bismuth element (2 c c. of bismuth salicylate in oil) are given intramuscularly every second day for four doses

(iii) *Long term multiple syringe arseno-bismuth therapy* (Eight weeks.) One milligramme of mapharside per kilogramme of body weight *is given* intravenously three times a week for eight weeks 75 milligrammes of bismuth element (1 c c of bismuth salicylate in oil) are given intra muscularly twice a week for sixteen doses

Bundesen Bauer and Kendell reported on some 1 500 cases treated by one or other of these measures (*Jour Amer Med Assoc* (1943), 123 810) In this preliminary report the results were satisfactory There were two deaths in the fever and arseno-bismuth therapy group out of *931 cases.* Both were attributed to tuberculosis,[1] which is recognised now as a serious contra indication to *any* intensive therapy Nitritoid crises were comparatively rare. (*They are absent in the drip-treatment*) Milian's 9th day syndrome was fairly common Two cases of encephalopathy occurred in 300 patients submitted to the seven day short term treatment Both recovered The most frequent complication seen was bismuth stomatitis.

[1] Active miliary tuberculosis was found post-mortem in one case No autopsy in the other

TREATMENT SCHEME. 26 WEEKS COURSE. U.S.A. ARMY

Arsenical	Weeks	Bismuth
Mapharsid intravenously twice weekly 20 injections.	1–5	bismuth subsalicylate intramuscularly weekly Five doses.
	6–10	omit bismuth for five weeks.
Omit mapharside for 6 weeks.	11–16	bismuth subsalicylate intramuscularly once weekly Six doses.
Mapharside twice weekly intravenously 20 injections	17–21	omit bismuth for five weeks.
	22–26	bismuth subsalicylate intramuscularly once weekly Five doses.

The first few doses sterilising the surface lesions were given at a hospital centre, the remainder in the patient's unit.

Intensive treatment of early syphilis. We have already recorded our agreement with the views of Lloyd-Jones and Gordon Maitland that the administration of the same total dosage of the arsenicals to all types of early syphilis is illogical. We were sure that a proportion of the patients were over-treated but could offer no criterion whereby this fault could be remedied. Lloyd-Jones and Maitland have recently published observations on 100 patients in the Royal Navy which tend to show that such criteria are possible if there be available the services of a serologist skilled in the practice of the Kolmer Wassermann or some other equally reliable sensitive quantitative test. By daily observations of the serum reaction and estimation of their quantitative variations they are able to divide cases of early syphilis, without or with positive serum reactions, secondaries and early latent cases into three groups. (For details and graphs the reader should consult their paper (*Brit. Med. Journ.* 1943, 2 448).)

The three groups are :—

(1) *Early primary* requiring a small abortive dose. A total of 600 to 900 milligrammes of mapharside, *in 15 daily* doses. The amount depends on body weight, approximately 20 to 30 milligrammes per kilo.

(2) *Middle primary* requiring 20 daily doses a total of 800 to 1 200 milligrammes.

(3) *Late* requiring 30 daily doses. Total 1,200 to 1 800 milligrammes.

There were three cases of clinical relapse. The only serious reaction was one case of agranulocytosis, which was promptly recognised and cured by 110 c.cm. of pentnucleotide. There were eleven cases of jaundice. Of

treated the better If it were the rule that every pregnant woman should have a serological test in the ante-natal period and treatment by arsenicals and bismuth were immediately instituted, hereditary lues, already an uncommon condition should disappear A history of miscarriage should certainly lead to a Kahn or Wassermann examination. Whatever steps be taken we may reasonably expect that cases of congenital syphilis will occur Treatment is by penicillin mercury or by arsenicals.

Penicillin is safer than the arsenicals and it has been reported that 10 000 units have been tolerated every four hours with good results even in gravely ill infants Some American workers recommend a total dose of 40 000 Oxford units per kg body weight, given in sixty intramuscular injections at three hourly intervals over a period of seven and a half days and any serological or clinical relapses should be treated by double the original dose Until further statistics are available it would appear to be desirable to continue treatment after a course of penicillin with one of the older remedies Penicillin has been given by mouth to infants

Mercury is well borne by even the youngest infant Inunction is the method of treatment to be preferred. A quarter of a drachm of unguentum hydrargyri is rubbed into the abdomen once a day after bathing A flannel binder is worn over the ointment so that the movements of the child may promote absorption The mother should be treated at the same time if possible In her case the usual course is adopted The duration of mercurial treatment in the infant depends upon the severity and duration of the symptoms and should be controlled by the Wassermann reaction Some authorities advise administration by the mouth in congenital syphilis. The usual form of mercury given is hydrarg c creta one fourth to one half grain with a little sugar of milk thrice daily Should there be diarrhœa, which is exceedingly uncommon a quarter of a grain of Dover s powder may be added to the mercury and chalk

The presence of snuffles sometimes prevents the child sucking and in such cases feeding by the spoon must be employed.

Arseno-therapy It was generally recommended that arseno-therapy should be used, although eminent pediatricians still adhere to mercury Others prefer bismuth. Stovarsol (*vide infra*) has strong advocates. The dose of neo-arsphenamine or sulpharsphenamine is 0·01 gramme per kilogramme of body weight

Intravenous injections may be made into the prominent veins of the scalp They have also been given into the superior longitudinal sinus. It would appear that injections into bone marrow might prove of value. Sulpharsphenamine is given *intramuscularly or by deep subcutaneous injection* In young infants the back is chosen for the injections.

Nabarro holds that the weekly injection is a serious trial to many children and prefers the oral administration of *stovarsol* Treatment by the mouth has two grave disadvantages in out patient practice One can never be sure that the drug is actually taken and when one is dealing with a potent remedy the early signs of intolerance may be overlooked. If however the patient can be under skilled observation as in the County Council congenital syphilis clinics (*e.g* the Welander Homes ") or otherwise, good results can be assured Nabarro reported on 110 cases The

usual course was of nine weeks duration. It was followed by three or four weeks rest and repeated. In this way four courses could be given in a year The system adopted was as follows: The crushed tablets of stovarsol were given suspended in milk or water about half an hour before food. The whole dose could be given before breakfast or in divided doses during the day Dosage —

First week: 12 milligrammes per kilogramme of body weight daily
Second week: 18 milligrammes per kilo daily
Third to ninth weeks: 24 milligrammes per kilo body weight.

Serological tests were made every three months during the first year twice during the second year and annually as long as possible after

Even under the best conditions stovarsol treatment requires watching Rashes are not uncommon, diarrhoea and vomiting often give trouble and demand substitution of another drug Fatalities have been recorded.

In early cases a positive serum reaction may be reversed in two to three months, but in later cases it may be several years before a permanently negative reaction may be achieved.

In congenital syphilis the rash usually disappears in from one to two weeks after the injection. Condylomata clear up in about the same time Coryza and snuffles may take six weeks to three or six months to disappear Lesions of the nails heal in about two months, but epiphysitis may disappear in a week to a fortnight. It may take eight or nine months to cause the absorption of hepatic and splenic enlargements In the rare tertiary lesions of congenital syphilis mercury and iodides act with great rapidity and equally good results follow the intravenous injection of neo-salvarsan.

Condylomata and other local lesions of congenital syphilis are treated with a calomel dusting powder

Treatment of latent syphilis. In the interests of the patient, the consort and potential children it is necessary to treat latent syphilis. If the infection has been comparatively recent and the cerebro-spinal fluid be normal, the usual courses of treatment are carried out and about half the patients will give a negative serum reaction and be free from clinical relapses. Patients under forty years of age who still have a positive serum reaction after the full courses have been given require further treatment.

Treatment of tertiary syphilis. The tertiary lesions which come to the dermatologist are mostly gummata of the muco-cutaneous system. It may here be noted that cardio-vascular lesions and affections of the central nervous system are comparatively rare in patients with muco-cutaneous gummata.

Warning It is important to recognise that there is a risk in beginning treatment in this stage with the arsenicals because these are prone to cause Jarisch Herxheimer reactions which may prove fatal if there are gummatous or vascular lesions in vital areas, e.g the myocardium, in the neighbourhood of important nerve centres, etc. The proper procedure is to give two or three weeks treatment by iodide of potassium (grs. xv to grs xx. t.d.) orally three times a day with or without sarsaparilla. Colloidal iodine (Crookes New Solution), 5 to 22 c.c. a day intravenously is preferred by some clinicians. We have been greatly impressed with the value of

mercurial inunction in these cases provided it is properly carried out. It may then take the place of bismuth injections

After these preliminary measures 0·01 to 0·02 gramme of mapharside or 0 15 gramme of neoarsphenamine a week may be given and increased gradually

It is advisable to give two courses of arsenic and bismuth during the first year The clinical results are most gratifying gummata seem to melt away and extensive ulcerations heal with far less scarring than had been anticipated.

But even with the intensive treatment outlined above some 20 per cent. of the patients will still give a positive serum reaction It must, however be noted that in not a few cases the reversal of a positive Wassermann or Kahn may not occur until treatment has been suspended for some months

It is *generally agreed that intolerance of arsenicals is commoner in* luetics with tertiary manifestations than in the early cases It is said to be present in over 40 per cent. of the patients We think this estimate is too high.

It may be mentioned here that the treatment recommended for tertiaries is equally applicable to cases of *lues congenita tarda* (p. 554)

Hitherto penicillin has been used almost entirely in early *i.e.*, contagious *syphilis* *We have therefore little information as to its effects on* late manifestations

REFERENCES—The following books, etc are worth study by the student: "Syphilis from the Modern Standpoint J McIntosh and P Fildes 1911 Arnold. History and development of modern methods with copious references. E. Bruusgaard. Natural History of Untreated Lues. *Archiv Derm und Syph* 1929 157 309 Pathology A Warthin "Lesions of Latent Syphilis. *Brit. Med Journ.*, 1929, 157 309 Treatment. Earl Moore *et al* "The Modern Treatment of Syphilis. 1942 (Baillière Tindall & Cox) Third Printing (1944) for recent developments. League of Nations Report on Treatment in Five Countries (1925). W R. Snodgrass and R. J Peters "Analysis of Results. *Med Research Counc. Reports*, 1937 Hyman "Continuous Drip Treatment. *Bulletin New York Acad Med.*, 1941 17 105 C. K. O'Malley "Massive Arsenotherapy *South African Med Journ* 1941 15, 843 Historical. Good summary in McIntosh and Fildes book (*supra*) Prof Gougerot's Leçons in the *Journ des Praticiens* Exotic Syphilis. Gougerot's Leçons and v During's "*Forschungen und Fortschritte* *May 10 1933* *Lloyd-Jones*, Allen and Donaldson, 1940 *Brit Med Journ* 1 507 Lourie et al 1943 *Lancet*, 2, 696

Ulcus molle. Soft Chancre. Chancroid

A highly contagious ulceration caused by infection with a strepto bacillus, the *Hæmophilus ducreyi*

Etiology The infection almost always occurs in coitus by the inoculation of an erosion or herpetic sore with the pus from a soft chancre Extra genital soft sores are extremely rare

In large centres in Europe and North America soft sore is less common than syphilis The North African littoral the Far East and the Southern States (U.S.A.) show a higher incidence of infection by Ducrey's organism than by the *Treponema pallidum* In troops and naval ratings in areas where intercourse with native women is common the incidence of ulcus molle is very high Military statistics for Europeans in the *Dutch East* Indies in 1920 showed 155 5 per 1 000 soft sore cases against 58 0 per 1 000 *syphilis* In the East African campaign of the present war ulcus molle

was found to be common in African soldiers and frequently complicated syphilis.

Pathology The parasite is a short, Gram negative non-spore-bearing bacillus with rounded ends, sometimes occurring in pairs and often in chains, hence the name *streptobacillus* It has been cultivated upon peptonised human skin and on blood gelose. Rabbit serum treated with ascites-phosphate agar containing 5 per cent. sheep's corpuscles gives the most rapid cultures. Monkeys and some other animals can be inoculated. The lesion is a destruction of the epidermis and part of the dermis, the surface of the ulcer being covered with pus containing the organism. Under the purulent layer lies a plasma-cell infiltration with inflammation of and around the vessels.

Clinical features. The soft chancre develops very rapidly In two or three days after infection a small vesico-pustule appears, which soon develops into a small ulcer The ulcer enlarges rapidly but rarely exceeds a sixpenny piece in size. The edges are elevated and often fissured. The floor is covered with a greyish yellow or greenish material, and exudes an abundant purulent secretion. The base of the ulcer is free from induration, and around it is a red slightly swollen areola. The sore is painful and tender and bleeds easily on handling The soft chancre is rarely single. Auto-inoculation is exceedingly common, and multiple sores of all sizes are frequent. In the male the prepuce the balano-preputial sulcus, glans, and frenum are the common sites. In the female, the vestibule, the labia minora, clitoris and fourchette are most commonly affected. By auto-inoculation lesions often occur in the anal region, in the gluteal cleft, and on the pubic region and the inner sides of the thighs. The secondary chancres may be little larger than a lentil seed.



Fig. 299 Chancroid in coronal sulcus. (L. T Burke)

The lymphatic glands are swollen, painful and tender and tend to suppurate early The bubo is of large size, and on rupture forms an ulcer with fistulous tracks. The gland swelling may appear three to four weeks after the ulcer has healed and it may suppurate (Fig 300).

From mixed infection, phagedæna and gangrene may occur but they re rare. Soft sore complicating syphilis, mentioned above is said to delay the ppearance of the constitutional symptoms of lues (S. T Pawlow).

Diagnosis. The multiplicity of the lesions, their early appearance after exposure to infection the characters of the ulcers and especially the

mercurial inunction in these cases provided it is properly carried out. It may then take the place of bismuth injections

After these preliminary measures 0·01 to 0·02 gramme of mapharside or 0·15 gramme of neoarsphenamine a week may be given and increased gradually

It is advisable to give two courses of arsenic and bismuth during the first year The clinical results are most gratifying gummata seem to melt away and extensive ulcerations heal with far less scarring than had been anticipated.

But even with the intensive treatment outlined above some 20 per cent. of the patients will still give a positive *serum reaction* It must, however be noted that in not a few cases the reversal of a positive Wassermann or Kahn may not occur until treatment has been suspended for some months.

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Ulcus molle. Soft Chancre. Chancroid

A highly contagious ulceration caused by infection with a streptobacillus the *Hæmophilus ducreyi*

Etiology The infection almost always occurs in coitus by the inoculation of an erosion or herpetic sore with the pus from a soft chancre Extragenital soft sores are extremely rare

In large centres in Europe and North America soft sore is less common than syphilis The North African littoral, the Far East and the Southern States (U.S.A.) show a higher incidence of infection by Ducrey's organism than by the *Treponema pallidum* In troops and naval ratings in areas where intercourse with native women is common the incidence of ulcus molle is very high. Military statistics for Europeans in the Dutch East Indies in 1920 showed 155 5 per 1 000 soft sore cases against 88 9 per 1 000 syphilis. In the East African campaign of the present war *ulcus molle*

belladonna. Early buboes clear up rapidly after the injection of Dmelcos 0·5 c.c. every fourth day. Pus should be aspirated and the cavity injected with a solution of 10 parts each of iodoform, guaiacol and eucalyptol, 20 parts of balsam of Peru in ether up to 100 parts. The 1 per cent proflavine in 99 per cent. of sulphathiazole powder may be insufflated into a cavity with advantage.

REFERENCES—R. T. BURKE. "Venereal Diseases," 1940, p. 96. H. N. COLE. *Ven. Dis. Information* 1940. R. A. KORNFLITS and L. CHARGIN. *Journ Amer Med. Assoc.*, 117, 2138. J H SEQUEIRA. "Some Lessons of the Epidemic of V.D., 1914-18. *Lancet*, 1931 1, 67 A. N CHAPMAN and J E. KANTOR. *Rev. franç de Derm et de Ven.*, 1938, p. 387

Erosive and gangrenous balanitis (fuso-bacillary balanitis) may be mistaken for *soft sore*. It begins as an acute erosive and phagedenic infection which may proceed to extensive destruction of the penis. A vibrio and a gram negative spirochæte, thought to be identical with that found in Vincent's angina, are found in the lesions. Harris and Corbus found hydrogen peroxide dressings were most effective and Sutton cured an advanced case with interstitial injections of oxygen.

Ulcus molle serpiginosum. A chronic spreading ulceration of the groins and adjacent parts which occasionally follows a soft sore in patients



FIG. 300. Ulcus molle serpiginosum.

who have lived in the tropics. The process apparently begins with the breaking down of a suppurating gland secondary to ulcus molle. The ulcer gradually spreads until it may involve a large part of the thigh or of the abdominal wall. The edge of the ulcer is ragged and deeply undermined, the overhanging part being white, while outside the colour is first purplish and then red. The base is fleshy uneven, and secretes freely. If improperly treated it may last for several years. The extreme chronicity which may be a feature of this condition is well illustrated by a case described by Gross. The ulcer had resisted treatment for eight years and was finally cured by the application of the Paquelin cautery. Ducrey's bacillus is found in the lesions. Iodide of potassium up to 10 grains a day and local

absence of induration are points which distinguish the soft sore from the Hunterian chancre. The early involvement of the glands, which are large painful and not shotty is also a valuable diagnostic feature.

As a routine we advise the following —

(1) Until examination is completed the *sore or sores must only* be dressed with normal saline.

(2) Serum from the ulcer is examined by the dark field method to exclude *Treponema pallidum* and this should be repeated during the next *three* weeks because mixed infections are common in tropical especially military practice

(3) Exudate from the sore may be stained by Gram and examined for Ducrey s organism.

(4) *Reenstierna s test* should be performed. 0·1 c.c. of vaccine prepared from the bacilli is injected *intradermally* in the forearm. A positive reaction is the formation in twenty four to forty-eight hours of an indurated erythematous papule 10 millimetres in diameter with a red halo about 5 mm. wide There may be a systemic reaction with pyrexia (101°–102 F).

Dmelcos, a commercial vaccine made from killed bacilli is commonly used for the Reenstierna test. N B It must *not* be given subcutaneously

In countries where lymphopathia venera (p 638) is prevalent it is good practice to inject one forearm with Dmelcos and the other with the Frei antigen

(5) If a soft sore has persisted for two to three weeks a serological test for syphilis must be made.

Treatment. *Prophylaxis* Calomel cream used as a prophylactic *against syphilis is valueless against soft sore* *Washing with soap* and hot water immediately after risk is effective

General measures In an acute attack the patient is best in bed and complete rest is necessary if a bubo is present

Local treatment. Hypertonic fomentations applied several times a day are of value. Excellent results have been obtained by dressing the sores with S P powder proflavine 1 part, sulphathiazole 99 parts

Specific treatment. Intravenous injections of Dmelcos (therapeutic strength) are given in the following doses 1 c c. on the first day 1 5 c.c on the third day 2 c.c. on the fifth 2 5 c c on the seventh, and 3 c.c. on the ninth and eleventh days A rigor with a temperature of 103 F may occur about four hours after the injection.

(In India a locally prepared vaccine for intramuscular injection is similarly employed)

Sulphonamide therapy The sulphonamides notably sulphapyridine and sulphathiazole are valuable additions to the therapy of soft sore and may be given when Dmelcos is not obtainable. Three grammes are given daily for the first week, 2 grammes daily for the second

Operative measures We do not recommend the old fashioned custom of slitting the prepuce in every uncircumcised sufferer from ulcus molle Such a practice often lengthens the stay of the patient in hospital Should circumcision appear advisable it is better to wait for two months after the sores have healed

An inflamed bubo should be fomented or dressed with glycerine of

The disease is most commonly met with in the West Indies, British Guiana and Brazil. It has also been observed in Fiji, India, West Africa, Australia and China. Imported cases are occasionally seen in this country McDonagh suggests a relationship between this affection and ulcus molle serpiginosum (*vide* p. 502).

Sequeira's first patient was a negro born in Antigua, but who had spent the greater part of his life in Jamaica. He came to London as a ship's fireman in January 1906 In April, 1907 he said that a swelling formed at the left angle of the mouth, and at the same time an infiltration developed in the right groin. Some months later an ulcer appeared on the dorsum of the penis. The tumour at the angle of the mouth at first sight suggested an epithelioma; it extended



FIG. 302. Granuloma inguinale. (From Dr C. W Daniels Tropical Medicine and Hygiene.")

in the form of a horse-shoe round the commissure of the lips, affecting both the skin and mucous surface. The growth was florid red and measured an inch and a quarter in its extreme width. It was soft to the touch and very vascular On the surface there was some erosion which exuded a yellowish discharge. The glands were not palpable In the left groin there was a line of infiltration running outwards from the pubic spine along Poupart's ligament nearly to the anterior superior spine of the ilium. It was of a pinkish colour and sclerosed in the greater part of its length, but in two or three places there was some superficial ulceration. All the lesions in this case cleared up with remarkable rapidity under repeated small doses of X-rays. The microscopical examination showed the growth to be a granuloma, but no organisms were recognised in the sections.

The anal region and perineum are often involved (Fig 302) and there may be ulcers on the thickened skin of the penis. The condition must be classed as an infective granuloma, probably of protozoal origin. It is

applications of camphor phenol and iodoform are the best treatment (McDonagh) McDonagh suggests a relationship between this condition and granuloma inguinale (p 503), and this is supported by the fact that the intravenous injection of antimony has proved of great service (vide p 504) The early cases described were nearly all of tropical origin, but a number of instances have been recently seen in soldiers who have been on service in Europe (Fig 300)

Ulcus molle is included in this section for the convenience of the reader since this condition and *granuloma inguinale tropicum* and *lymphogranuloma inguinale* are all apt to give trouble in diagnosis and in some of their phases to produce lesions very similar to those met with in syphilis.



Fig 301 Ulcus molle Inguinal bubo broken down. (Reproduced by permission of the late Dr E. C. Smith.)

It is usually easier to exclude syphilis first by examination for treponemata or later by the serological reactions Ulcus molle may also be distinguished by recognition of the organism.

Lymphogranuloma is a virus infection (see p 038) and here the test with Frei s antigen as later described is of great diagnostic value In *granuloma inguinale tropicum* no specific organism has been isolated and the diagnosis depends largely on the exclusion of the conditions above mentioned

Granuloma inguinale tropicum Ulcerating granuloma of the pudenda

A chronic ulcerative affection of the groin and neighbouring parts associated with papillary hypertrophy In a case of Sequeira s there was also a granulomatous swelling at the left angle of the mouth.

CHAPTER XXV

CHRONIC INFECTIVE DISEASE OF THE SKIN (Tropical)

Yaws—Pinta—Leishmaniasis

Yaws (Framboesia tropica) Parangi. Plan

(French, *framboise* raspberry)

It is a chronic infectious disease endemic in the tropics. It is [illegible]d by nodular vegetating and fungating lesions. It occurs in the Orient, in Oceania, in Central and East Africa,



FIG. 303 Yaws, Framboesia tropica. (Wellcome Bureau of Scientific Research. Copyright.)

and in Central and South America. The greatest incidence is about the 80° F isotherm. Artificial tropical conditions such as were present in the Johannesburg mines were a suitable environment in an epidemic in 1930–31 In its course it resembles syphilis, and for a long time many eminent authorities believed that the framboesia tropica was a variety of syphilis. Recent researches have, however shown that it is caused by a distinct, though morphologically similar parasite.

distinguished from yaws by its peculiar localisation The case mentioned above is the only one recorded in which the granuloma has been away from the pudendal and anal regions

Intravenous injections of antimony (gr 1 of antimonium tartaratum dissolved in 2 ounces of normal saline) repeated every third or fourth day have cured numerous cases It may be necessary to give as many as twenty injections and the dose may be gradually increased to 2½ grs. (Aragao Vianna) Manson Bahr advises the local application of a 1 per cent ointment of tartar emetic while the intravenous treatment is carried out. Sulphonamides in full doses are valuable in treatment

There are no visceral lesions peculiar to yaws, and endarteritis, which is so prominent a feature in syphilis, is absent. Schöbl and Hasselmann maintain that *Tr pertenue* is essentially an ectodermic parasite while *Tr pallidum* affects the mesoderm.

Clinical features. There is a period of incubation lasting from a fortnight to three months. In this stage there is slight fever accompanied by headache, articular pains, and digestive disturbance. The primary lesion is a conical pinkish elevation, the centre of which necroses, becomes incrusted and indurated, and finally papillomatous. The commonest sites are the lower extremities and the arm, particularly the elbow flexure, the breasts of nursing women, and the mouth of the suckling infant. Genital



FIG. 308. Leucoderma in late yaws in an African. Old finger lesions on toes. (Photograph kindly lent by Dr J C. Carothers.)

lesions occur in about 1 per cent. of the cases. In some cases the primary yaw is unnoticed, but often persists for several months. Clinically it may be very difficult to distinguish the primary from lesions of the secondary stage. It varies in diameter from one to five or six centimetres. The eruption, which begins from one to three months after the primary lesion, is scaly often circinate, and does not itch. It is all of one type, and may affect the whole skin. The plaques are from one-third of an inch to two inches across they are covered with adherent brownish crusts, and sometimes there is a fœtid secretion. Three months after the appearance of the primary yaw an outbreak of small papules occurs These are highly characteristic. Some are little larger than a millimetre, but in a large proportion they increase to 2–3 centimetres (Fig 308). Groups of these lesions form at the angle of the mouth, in the nostrils in the armpits,

infection by the organism of syphilis Yaws is not a venereal disease, but is usually contracted in infancy through some breach of the surface, and Castellani believes that flies and other insects may introduce the parasite. Callanan in Kenya examined 253 cases and found 72 infections began on the feet, 60 between the ankle and knee, 23 on the upper limbs, and only 8 on the head. There were 27 primary infections of the nipple but only 9 all children, on the genitals The people examined go about barefoot and the children nearly naked. The Johannesburg miners had no foot lesions for they wore boots Yaws is highly contagious and in the early stages auto-inoculation is possible. When once fully developed it confers immunity



FIG 307 Yaws. "Moth-eaten type of erosion of feet. (Reproduced by permission of the late Dr E. C. Smith.)

upon the patient It is not hereditary nor congenital. A pregnant woman suffering from yaws does not give birth to a child affected by the disease, nor does the infant develop yaws unless it be directly inoculated. In this respect framboesia tropica shows a marked difference from syphilis

Males are more commonly affected than females and in about 70 per cent. of the cases infection occurs before puberty though no age is exempt. In some African tribes nearly every individual has at some time suffered from yaws Monchet found an incidence of 100 per cent in the Belgian Congo Similar reports come from South America and Polynesia.

Pathology The lesions show an increase in the horny layers of the epidermis hyperkeratosis, and also parakeratosis. There are numerous plasma cells, but no giant cells The papillae are much hypertrophied.

walking Cribriform patches (Fig 307) are very characteristic of old yaws)

Ulcers may be deep and lead to grave cicatricial contraction.

Sabre tibia (Fig 311) is not uncommon.

Onychia, paronychia and dactylitis may cause deformity

Diagnosis in the atypical form may be difficult for the newcomer in the tropics. The positive Wassermann or Kahn will exclude all but similar syphilitic lesions and the rapid response to arsenotherapy in the early stages and the more tardy yielding of the later conditions are useful therapeutic tests.

The eruption may last for some months and recur during several years. The mucous membranes may be involved but apparently only by the



FIG. 310. Gangosa. (Photograph by Balfour for the Wellcome Bureau of Scientific Research. Copyright.)

extension of cutaneous lesions into the buccal and nasal cavities there are no visceral lesions, and alopecia is unknown. The glands may or may not be generally affected. Swelling of the joints and neuritis may occur Gummatous nodes are occasionally seen

Gangosa is a slowly destructive ulcerative process involving the palate nose, pharynx and skin. The name "gangosa" signifies nasal voice (Fig 310).

It is a sequel to yaws. The disease attacks males and females equally There is reason to believe that it is a re-infection (*cf* Koch's phenomenon in tuberculosis (p. 496).

Pathology The lesions consist of infiltrations of round cells, chiefly lymphocytes giant cells are also found, and there is proliferation of the vessels and hæmorrhage into the affected tissues. The process ends in necrosis.

groins and gluteal cleft The eruption itches The typical yaw is a roundish swelling capped with a yellow crust the smaller lesions being hemispherical the larger flat, often with a depressed centre. Under the crust is a red, smooth surface from which exudes a yellowish serum containing the treponema pertenue Vegetations of a red or greyish colour form and while the centre of the lesion tends to heal, bullæ develop around it The polycyclic character of the lesions suggests a hypertrophic fungating syphilide (Fig 305)

Atypical yaws. These eruptions may occur in the early and late stages of the disease They are —

Early *Dyschromias* Areas of depigmentation and of hyperpigmentation are common. The surface may be slightly scaly They



Fig 300 Yaws. "Marmoriform" depigmentation and ichthyosis of hand. (Reproduced by permission of the late Dr E. C. Smith.)

may simulate maculo-anæsthetic leprosy but there is no anæsthesia.

Follicular hyperkeratosis is an interesting form. It is widely spread and closely resembles the follicular syphilide It is often associated with adenopathy

Serpiginous or ringed lesions are often known as 'ringworm yaws.

Late *Dyschromias* occur in the late stages sometimes producing a marbled (marmoriform) appearance (Fig 300)

Ichthyotic changes are most often seen on the palms.

Keratodermia plantaris et palmaris Crab yaws (Fig 301) The lesions begin with an eroded or moth eaten surface. They are painful and tender especially on the feet after

syphilis for it may be inoculated into patients suffering from active lues. Re-infection may be effected in sufferers from pinta in the early stages but in later cases there is complete immunity. As already mentioned at this period every patient has a positive serum reaction.

Treatment. The treponemata disappear in twenty four hours after the administration of arsenic. Bismuth is as valuable in pinta as in yaws and syphilis. In early cases treatment will remove the lesions. Even in the late dyschromias improvement may occur, the dark areas fading and pigment may appear to a slight degree in the white patches. Hyperkeratosis of the soles and palms disappears.

REFERENCE.—V. PARDO-CASTELLO and L. FERRER. *Archives of Derm. and Syph.*, Chicago, 1942, 45, 844. A well-illustrated review of the disease as seen in Mexico and current literature to date.

Oriental Sore. Dermal Leishmaniasis

An endemic disease in certain parts of Asia and Africa, South America and Southern Europe, characterised by the formation of nodules, and ulcerating and vegetative lesions. The disease may develop after leaving the tropics.



FIG. 814. Oriental sore (Baghdad case.) (After Wenyon.)



FIG. 815. Oriental sore. (South American case.) (After Wenyon.)

Many local names are given to this affection, *e.g.*, Aleppo or Delhi boil, Biskra button, etc. Nile boils as seen in the Anglo-Egyptian Sudan are caused by a non-mobile circular coccus (Chalmers and Marshall).

Etiology. The disease is caused by the *Leishmania tropica* inoculated by a biting sandfly, *Phlebotomus papatasii* or *P. sergenti*. The *Stomoxys calcitrans* which feeds on the ulcers may also transmit infection. Small abrasions or wounds may possibly also be invaded.

As second attacks are rare inoculation in childhood has been practised where the disease is prevalent with the object of preventing later attacks.

Secondary manifestations The earlier lesions are light pink in colour but they soon become dark red, purple or slate-coloured according to the amount of pigment The surface is covered with adherent powdery scales. In some cases the scales are larger and suggest psoriasis or squamous eczema By coalescence large plaques may be formed and any part of the integument may be affected, but the commonest sites are the extremities over bony prominences and generally on uncovered areas In the course of several months the lesions tend to undergo involution the central parts become paler and even devoid of pigment. The spread of the eruption is slow and different stages may be present at the same time.

The general health is not affected Indeed, in some subjects the initial and early manifestations may be so ill-defined that they are unrecognised and the patients are not seen until the dyschromic stage has been reached



FIG 818 Pinta. (Photograph kindly provided by Dr Howard Fox.)

During the secondary stage 60 per cent. of the patients give a positive Wassermann or Kahn reaction. The treponema is easily identified in lymph from the skin by dark-ground examination. Discrete enlargement of the lymphatic glands has been observed and treponemata have been found in the fluid obtained from them.

Late manifestations The most important of these are the dyschromias, which formerly drew attention to the disease They are usually symmetrical and affect the hands and forearms and the feet and legs Triangular depigmented patches on the fronts of the wrists are useful diagnostic features Among the other parts where pigment changes occur is the scrotum It is obvious that vitiligo may be suspected, but dark ground examination in the earlier cases should make the diagnosis clear In every case of pinta in the late stages the Wassermann and Kahn reactions are positive In Cuba hyperkeratosis of the soles is a common symptom, but this is rare in Mexico

The pigmented areas vary with the normal colour of the skin In white subjects they may be a light brown in dark races they vary from jet black to slate or coffee colour Desquamation, when present, is usually branny and adherent

Sequelæ Cardio-vascular and cerebro-spinal changes have been reported.

Etiology The causal organism is the *Treponema carateum* Morphologically it appears to be indistinguishable from *Tr pallidum* and *Tr pertenue* though it is said to be somewhat longer Pinta is not

15 gramme ampoule was dissolved in a few drops of water and applied frequently on cotton wool. In non-ulcerated cases the solution should be injected into the lesion.

REFERENCES—A. LAVERAN "Leishmaniasis." Paris, Masson, 1918. G. C. LOW *Brit. Med. Journ.* 1919 2, p. 479 F. C. ORMEROD. *Lancet*, 1920 2, p. 882. M. L. THURSTON *Ibid.*, 1921, 2, p. 570. J. B. CHRISTOPHERSON. "Lupus Leishmaniasis." *Brit. Journ. of Derm.*, 1923, 35, 123. J. G. THOMSON. "Pathology" *Trans. Roy Soc. Med.* 1932, p. 23.

Espundia. Naso-oral Leishmaniasis. A chronic ulcerating granuloma of the skin and mucous membranes of the mouth and nose caused by the Leishmania tropica.

The disease occurs in Peru and in other parts of South America. An Indian variety has also been described, and Europeans who have long resided in countries where the disease is endemic may be affected.

The parasite is believed to be introduced by an insect.

Clinical features. The disease begins with a chancre-like lesion on an exposed part of the mucous membrane. The primary lesion heals up in a few months and then ulcers appear in the nasal and oral cavities. The palate may be involved and also the nasal cartilages. The tongue is not involved, but the upper lip may present an appearance suggesting lupus vulgaris. In the terminal phases the pharynx and larynx may be occluded and the infection may reach the bronchi. The ulceration is attended with an offensive odour and the destruction produces grave deformity The disease runs a chronic course and may last for twenty to thirty years.

The treatment is on the same lines as for dermal leishmaniasis (*vide supra*). Excision of the primary lesion has been recommended.

REFERENCES—DE AMICIS. "Transactions of the International Congress," 1909 Buda-Pesth. Other references in CASTELLANI and CHALMERS "Tropical Medicine," p. 1570. J. G. THOMSON *Trans. Roy. Soc. Med.* (Tropical Section), 1932, p. 23.

Leishmanides. The more common "leishmanide" does not appear usually until a year or so has elapsed and the patient has probably been under treatment for kala-azar Here the affection begins with depigmentation, and on the depigmented areas granulomatous papules and nodules appear The face and upper extremities are first affected but the eruption spreads to the trunk. The white spots spread until they are half an inch across. The Leishmania has been found circulating in the blood in rare cases. Some of the lesions pass on to a xanthomatous stage. They are then of an orange colour and do not ulcerate In the papulo-nodular stage the leishmanide may be mistaken for leprosy

Major A. C. E. Cole has described a curious eruption seen in African soldiers during the Abyssinian campaign. These men came from the River Omo district and were suffering from kala-azar of a serious type. Among the survivors Cole saw several cases showing discrete papules and nodules mostly on the face but also on the body Growth of the individual lesions and their coalescence formed a warty mass on the face and a "reptilian" skin on the trunk. The excrescences ultimately fell off or shrivelled up. Leishman-Donovan bodies were present in the lesions which were mainly hyperkeratotic. In the Sudan a similar condition has been observed.

Dr Heisch of the Kenya Medical Service informs us that injections of stilbamidine administered to patients suffering from kala-azar may often be followed by a maculo-papular eruption all over the body but especially on the face A scraping of the skin was frequently found to contain Leishman Donovan bodies. This phenomenon suggests a Herxheimer reaction

REFERENCES—R. KIRK and C B. DREW *Trans. R. Soc. Trop Med. Hyg.*, 1938, 32, 265. A. C. E COLE. *East Af Med. Journ.*, 1942, 19, 190.

It has been shown that where Kala-azar is common oriental sore is rare Both affections have been seen running concurrently by Kirk and doubt has been expressed as to identity of the Leishmania concerned.

Pathology The lesions show atrophy of the epidermis, and extensive infiltration of the corium and papillæ by lymphoid, plasma and large round cells These large round cells are the macrophages, which as the disease progresses are found to be filled with *Leishmania tropica.*

Clinical features. After an incubation period lasting from a few days to several weeks or longer one or more itching spots appear on uncovered parts of the skin. These lesions become indurated and increase to the size of a bean often having the appearances of a blind boil. After three months the nodule ulcerates, and is covered with a dried crust. On the removal of the scab an ulcer about an inch in diameter is found. The edges of the ulcer are sharp and the base is irregular and covered with reddish yellow granulations The lesions run an indolent course and are slightly painful The ulcer heals by granulation. There may be an intermittent fever before the development of the cutaneous lesions Multiple sores from auto-inoculation are not uncommon. As many as 150 have been observed at one time.



Fig 310 Non-ulcerating dermal Leishmaniasis. (Wellcome Bureau of Scientific Research. Copyright)

In some instances the mucous membranes of the nose and mouth are involved. Warty and non-ulcerative varieties of the disease occur in some countries We have seen cases in which apple-jelly like nodules simulating lupus vulgaris were definitely leishmanians as first shown by Christopherson.

The Leishman Donovan bodies are found in blood expressed from the lesions. The prognosis is usually good, but occasionally phagedæna occurs and death may ensue from septicæmia. Scarring may cause considerable deformity

Treatment. Small sores can be cured by a single erythema dose of X rays (450 r) in ten days (Treston). Larger lesions respond to the local application of crystals of permanganate of potash. But the most efficient remedy appears to be the intravenous injection of a 2 per cent. solution of tartar emetic, ½ grain of the antimony potassium tartrate being the initial dose Six doses are given in the course of fourteen days, the maximum being one grain. We have seen considerable depression follow the administration of this drug and care is required. An ointment of tartar emetic has also been used Manson Bahr finds the following preparation efficient dithranol grs 4 ichthyol grs. 8, olei cadini ℥40. benzoli rectificat. to one ounce. It is applied exactly to lesions with a camel hair brush. A carbon dioxide snow pencil is also useful.

Hossein Bannisadro reported the cure of ulcerated sores in three children in his own family by the local application of neo-salvarsan A

to this view and it may be found that included in the group of so-called viruses are simple unorganised agents which are capable of giving rise to disease and that these agents may arise spontaneously within living cells as a result of certain abnormal conditions and may be capable of being transmitted as an infection. This is hypothetical, and the morphology of some viruses provides supporting evidence that the elementary bodies are alive for they have been observed to develop into larger intracellular masses called *inclusion bodies* which have matured and broken down again in an orderly developmental cycle. Not all inclusion bodies have been recognised as a developmental phase of a virus and no doubt some of them consist of, or include degeneration products of the infected cell But whatever their nature true inclusion bodies are probably peculiar to virus diseases. Certainly in many virus diseases the morphology of these bodies and their constant presence are valuable diagnostic features. This is especially so in the case of the nuclear inclusions found in the lesions of herpes zoster and varicella. In these three diseases the characteristic inclusion bodies may be regarded as the hall-mark of a virus infection.

The lesions of the skin produced by viruses vary considerably In the case of molluscum contagiosum and warts, cellular proliferation produces papules and nodules resembling neoplasms in which inflammatory changes may be absent or inappreciable. On the other hand, in herpetic lesions, the inflammatory changes are early and marked. Exudation and leucocytic infiltration tend to obscure degenerative changes in the epidermal cells and make it difficult to dissociate primary and secondary phenomena The exudates and infiltrates become localised in the upper layers of the epidermis to form vesicles and pustules. So, the common virus lesions of the skin are manifestations of proliferative degenerative and inflammatory changes, and it is evident that a combination of such changes might account for degrees of dyskeratosis associated with inflammatory changes, producing erythro-squamous eruptions such as psoriasis pityriasis rosea or lichen planus. At present, however none of the erythro-squamous eruptions has been proved to be due to a virus.

Other types of skin reaction to virus infection are seen, but these are not necessarily virus lesions, *e.g.*, the erythematous macule of typhus, the urticarial rash of measles and the purpuric lesions seen in the fulminating exanthemata Lesions similar to these occur in bacterial diseases, and may also be caused by drugs

It is unwise, therefore, to draw inferences of virus etiology from clinical appearances or from gross histology for vesicles are not uncommon in urticaria, and warty growths may follow chronic chemical irritation of the skin, *e.g.*, tar warts or may arise as an eruption due to bromide, etc.

Methods of investigating virus diseases of the skin. Direct proof of virus infection requires the demonstration of an infective agent in the skin lesion, and since this agent does not grow on bacteriological culture media, proof depends upon the successful inoculation of man or animals including chick embryo and tissue cultures. Negative results of animal inoculation may be due to the fact that the animal used was not susceptible, and such results do not rule out the possibility of a virus origin, *e.g* the viruses of molluscum contagiosum and warts appear to be capable of infecting man only and in those instances evidence of virus etiology has been obtained

CHAPTER XXVI

VIRUS DISEASES OF THE SKIN

Vaccinia—Orf—Kaposi's Varicelliform Eruption—Herpes—Zoster—Molluscum Contagiosum—Warts—Lymphogranuloma Inguinale

ALTHOUGH the virus origin of disease was demonstrated half a century ago by Iwanowsky and since then over a hundred diseases of man animals and plants have been shown to have a similar cause, many of the established facts concerning the nature of viruses and their etiological significance in disease are not generally known

The Nature of Viruses

Many viruses are just visible as minute particles and are as certainly the specific cause of disease as the better known pathogenic bacteria. It would appear that viruses are elemental forms of life less organised than the bacteria, either something lower in the evolutionary scale or representing a reversion of a micro-organism to a simpler form as a result of prolonged parasitism. Indeed many viruses respond like bacteria to antiseptics, produce similar effects upon cells and can be investigated by the usual bacteriological procedures Thus the larger viruses have been seen as surely as the gonococcus to multiply in tissue cells and to produce colonies The individual virus particles called *elementary bodies* have been washed free from extraneous protein and their infectivity demonstrated. Further these particles have been agglutinated by specific antibody and in some instances the agglutination can be as readily observed under the microscope as in the case of the typhoid bacillus. After many virus infections the affinity of the virus for its specific antibody resulting in fixation of complement, can be revealed by using the well known bacteriological technique with slight modification Other resemblances between viruses and bacteria as pathogenic agents have also been observed and even in the degree of immunity which follows virus or bacterial infection no real difference exists for although some of the best examples of solid immunity are found in virus diseases, we also find recurrent attacks of diseases such as herpes and influenza

Special features. Virus elementary bodies are much smaller than bacteria varying in size from 0·25 micron to particles smaller than a single complex organic molecule which is of course far beyond the limits of vision with ordinary light *Thus a filter which retains bacteria* will allow a virus to pass, and the infectivity of such a bacteria free filtrate is direct proof of the presence of a virus

Viruses will only multiply in the presence of living cells consequently their study involves the use of an experimental animal or a chick embryo This fact not only deprives us of the convenient methods employed to culture bacteria but makes more difficult the proof that viruses are living agents. In fact one theory is that viruses are not alive but are of the nature of enzymes or catalysts having the peculiar property of increasing during their intracellular action. Some recorded observations lend support

ulcer Considerable œdema may be present, and because of the œdema, induration and adenitis, one infant with vulval lesions was thought to be suffering from primary syphilis. In a woman seen at the London Hospital, three spots appeared on the face nine days after her baby was vaccinated. The lesions became confluent and formed an ulcer 2½ inches transversely and 2 inches in the vertical direction.

Generalised vaccinia This name is often given erroneously to cases of widespread vaccinia due to auto-inoculation. A pure generalised vaccinia rarely occurs, but may begin four to nine days after inoculation, the lesions coming out in crops and passing through the stages of normal vaccinia papule, vesicle and pustule. The pustules are often umbilicated and closely resemble variola, but constitutional disturbances are much less marked, and some cases are afebrile Concurrent varicella might lead to an erroneous diagnosis of generalised vaccinia.

As a general rule, the prognosis of generalised vaccinia is good, but the condition may be serious, and even fatal when it supervenes on a pre-existing dermatosis, especially eczema. Tedder regards Kaposi's varicelliform eruption as a form of generalised vaccinia due to the hæmatogenous spread of the vaccine virus, but the evidence is inconclusive

Toxic vaccinia rashes. During the evolution of the vesicle that is, from the fourth to the tenth day transitory rashes are not uncommon They are of the same character as the rashes seen after the injection of diphtheria anti toxin, or vaccines and sera. The following varieties occur —

(1) Erythemata, generalised, punctate (like scarlatina), and roseolar
(2) Erythema multiforme.
(3) Macular eruptions resembling measles.
(4) Urticaria.
(5) Papular eruptions.
(6) Vesicular and bullous eruptions, which are sometimes combined with (5).
(7) Hæmorrhagic rashes.

The erythematous, scarlatiniform and urticarial eruptions are the most common. The hæmorrhagic variety is very rare. Those resembling the exanthemata may lead to difficulties of diagnosis should there be an epidemic of scarlet fever or measles at the time The papular and papulo-vesicular forms must be distinguished from lichen urticatus, which is common in infancy and which may co-exist.

Bullous dermatitis It will be convenient here to mention that bullous eruptions have been seen in connection with vaccination. The eruptions have generally occurred after the vaccinia lesions have healed, but it is probable that they are toxic (Fig 317).

Bowen described several cases in which there were erythematous and bullous lesions. Besides this polymorphism, the cases presented other features resembling dermatitis herpetiformis, viz., eosinophilia of the contents of the blebs and of the blood. Corlett and Stelwagon have described eruptions of bullæ and in 1902 Sequeira showed, at the Dermatological Society of London, a man of thirty-nine with an extensive crop of bullous lesions which followed re-vaccination. He was informed that the

by experimental transmission in man In many diseases human experimentation would be unjustifiable owing to the risk involved. Indirect evidence of virus infection may be obtained from antigen-antibody reactions and in the case of varicella, zoster psittacosis and variola, specific agglutination of elementary bodies with the patient s serum has been demonstrated by Amies, Bedson and Ledingham amongst others.

Finally the discovery of inclusion bodies in the cells of lesions suspected to be of virus origin may be regarded as direct proof of a sort, but the difficulty of distinguishing true inclusions from granular degeneration products in the cytoplasm or nucleus is very real especially in the case of the epidermis.

Considering the large number of dermatological conditions of obscure etiology it is disappointing that so few are of established virus origin, namely herpes, zoster molluscum contagiosum, warts and lymphopathia venerea, although vaccinia, foot and mouth disease, milker s warts and orf, must be included. The virus origin of Kaposi s varicelliform eruption has not been satisfactorily established, but the condition will be mentioned here because of its close clinical resemblance to generalised vaccinia.

Vaccinia and Vaccination Eruptions

Ignorance and prejudice frequently attribute to vaccination a large number of cutaneous infections in childhood. While it is true that vaccine lymph has often contained contaminating cocci there is now no danger of conveying tuberculosis or syphilis However infantile eczema and seborrhoeic dermatitis are often aggravated by vaccination and infant vaccination in these conditions should be withheld unless a definite risk of exposure to smallpox exists

Eruptions produced by pure vaccinia. The lesion produced by inoculation of bacteriological sterile lymph is a clear vesicle arising on an inflamed base. If the lesion is kept clean and dry a crust soon forms and healing is complete in a week or ten days. Occasionally keloid develops later in the scar Often, as a result of friction and secondary infection, a purulent reaction occurs and the whole limb may become red, swollen hot, tender and painful with constitutional disturbance and pyrexia. This emphasises the importance of efficient disinfection of the sites of inoculation followed by protection of the vaccinia lesions by antiseptic dressings. A dry dressing is adequate for a simple reaction, while treatment in the more severe reactions consists of putting the limb at rest in a sling and the application of soothing lotions of lead or calamine containing 1 or 2 per cent. of phenol.

Auto-infection. Auto-inoculation is not uncommon. In some instances a few lesions develop in the neighbourhood of the vaccination in others the eruption is widely spread. Infection is conveyed by scratching before the primary vesicles have healed, and consequently it may occur as late as the tenth day In some of these cases the sites of auto-inoculation have been areas of eczema, impetigo and lesions of herpes varicella and the like. It is a wise precaution therefore, not to vaccinate a person suffering from *any* skin affection The secondary lesions arise as vesicles and umbilicated pustules which may become confluent and form a large

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first bleb appeared on one of the vaccination areas The contents of the bullæ were sterile and inoculation of animals gave a negative result

The toxic eruptions of vaccination demand no special treatment.

Local Infections The operation of vaccination must be performed with scrupulous care If properly prepared calf lymph be used, and



FIG 317 Vaccinal bullous erythema

especially if the instruments be sterilised and the site of inoculation disinfected, *foreign organisms* cannot be introduced with the vaccine virus. Where these precautions have been omitted streptococci and staphylococci may cause erysipelas impetigo and the like

Infection of the vaccination lesions at a later date is less under the

control of the doctor He can apply a proper sterilised dressing and give instructions, but he cannot be sure that the dressing will be allowed to remain in position or be changed when required. He cannot therefore prevent infection of the sites of inoculation, especially when he is dealing with the children of careless and dirty parents.

The complications which may thus occur are: (1) erysipelas (2) impetigo (3) furunculosis (4) cellulitis (5) ulceration (6) gangrene

The coccal infections are the most common. Erysipelas may prove fatal if extensive. The eruption appears later than the third day and is often easily traced to cases in the neighbourhood. Gangrene is fortunately rare, but if disseminated is fatal

Tuberculosis, syphilis, and leprosy have to be considered. We have seen several cases of lupus vulgaris starting in early life in vaccination scars. The patients, however had all been vaccinated before the introduction of calf lymph, and it is possible that the tubercle bacillus had been introduced with vaccine virus. It is more probable however that the introduction took place later or that arm-to-arm vaccination was used.

Undoubted cases of syphilis have been recorded, but so far as we are aware these were all before the introduction of calf-lymph. It is, of course, possible that a recently vaccinated baby might be inoculated with treponemata by contact with a case of syphilis.

Leprosy has been noted, but in this country it does not need consideration.

The infections mentioned in this connection are treated on the lines indicated in the respective articles devoted to them. The important point is to prevent them, and this can be done with ease if the simple precautions mentioned above are taken.

Eruptions of doubtful connection. Only two conditions require serious consideration viz., eczema and psoriasis.

Eczema is common in infancy and occurs independently of vaccination, but the eczematous eruption may first appear after vaccination, which is better deferred in eczematous or eczema-prone subjects We know however that some acute specific fevers, dentition, and other conditions which affect the general health predispose to it, and vaccination may act in like manner

Psoriasis sometimes starts in a vaccination scar But usually according to Crocker the patient is not an infant. We know that in predisposed persons slight injuries and wounds may be followed by psoriasis, and the vaccination wound is no exception. The complication is very rare.

Cowpox Vaccinia

Cases of direct infection of the human subject from the cow are comparatively uncommon, especially in large towns. A cowman aged fifty-one, who attended the London Hospital clinic suffering from cowpox was infected on his left index and *right little* fingers. Small inflamed spots appeared a few days after inoculation they rapidly assumed the appearance of blebs with a flat surface somewhat umbilicated. On the tenth day the lesions had attained diameters of 1 and 1½ cms,

respectively They were covered with a black crust surrounded by a bluish indurated margin The lesions were very painful and tender There was some enlargement of the nearest lymphatic gland On removal of the crust the ulceration healed up leaving a foveated scar The patient milked about a dozen cows twice a day and frequently pricked his fingers with thorns in the hay so that scratches may have been the sites of inoculation The patient had been vaccinated in infancy and had not had smallpox Cases have been described in which the face has been affected, and inoculation from one person to another by contact has been reported.



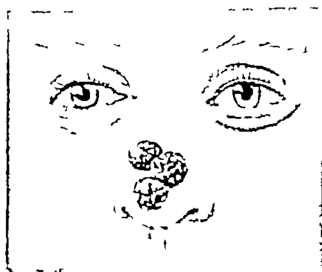
FIG 318 Cowpox. Hand of a dairyman.

The appearance and course of the affection are an exaggeration of the common phenomena of vaccination.

Three other conditions ascribed to virus infection and possibly related to vaccinia, will now be briefly described —

Milker s warts. Bonnevie (1087) described four cases with characteristic lesions which he regarded as a clinical entity The infection occurs in individuals who have been milking cows, on the udders of which a vesicular eroded and subsequently verrucose eruption ordinarily called cowpox, had been present. The first lesions are flat red papules which within a week, attain a size of ½ to 1 cm., and then appear as well-defined hemispherical, reddish blue firm elastic slightly tender nodules, the epithelial covering of which is tense slightly shiny greyish, opacue apparently thickened but unbroken, and without any sign of bullous detachment Later the central part turns yellowish, becomes a little depressed, and may form a slight crust or present dark red, easily bleeding papillomatous vegetations of very vascular granulation tissue At this stage the nodule is often surrounded by a narrow erythematous halo and there may be lymphangitis and lymphadenitis. As a rule the condition subsides in a few weeks independently of the treatment employed, and constitutional

PLATE 31



Oar

disturbances are slight or absent. Very rarely the eruption may be almost universal and resemble acute pemphigus but rapid resolution, without scarring usually occurs

Pathology The epidermis shows marked acanthosis with greatly elongated, narrow interpapillary processes, but no inclusion bodies have been recognised. An acute oedematous inflammatory reaction involves the dermis.

Etiology It is thought that the infecting agent is a filter passing virus, closely related to that of variola vaccinia, strongyloplasma para vaccinia (Lipschütz), which is known as the producer of "vaccine rouge" paravaccinia (v Pirquet). The weight of experimental evidence is certainly against the virus being identical with that of vaccinia. The disease also occurs in sheep, and its clinical manifestations are obviously very similar to those described as orf

Orf (contagious pustular dermatitis of sheep) (Plate 54). Peterkin (1937) described five cases of orf infection in man. Contagious pustular dermatitis or orf is a well-known disease of sheep, and Aynaud (1921) demonstrated that the disease was caused by a filterable virus and remarked that the experimental lesions produced resembled those due to the virus of vaccinia. However the relationship of orf to vaccinia remains uncertain. In man the disease is acquired by contact with infected animals, and the earliest lesion is a dark red papule which enlarges to 1 to 4 cm. diameter The papule is indurated and painless, and, later becomes umbilicated, resembling a large red molluscum contagiosum lesion. The depressed centre is covered with thin white skin and contains clear exudate, becoming purulent, and thus resembling a granuloma pyogenicum. After curettage the condition usually clears up with simple antiseptic lotions and dressings, in one to four weeks, and X ray treatment probably hastens recovery

Kaposi's varicelliform eruption. Kaposi's varicelliform eruption has many clinical features of an acute virus infection, and it was suggested that the vaccinia virus is the etiological agent. Certainly Kaposi's varicelliform eruption presents a clinical picture which is indistinguishable from generalised vaccinia, and with such an eruption as an immediate sequel to vaccination, the diagnosis of generalised vaccinia is rarely in doubt. On the other hand, when a patient with a pre-existing skin disease, usually infantile eczema or Besnier's prurigo develops such a papulo-pustular eruption with no history of recent vaccination or of contact with vaccinia, the disease is labelled Kaposi's varicelliform eruption Then, in spite of clinical resemblances to generalised vaccinia, the disease cannot be ascribed to that virus. Some recent evidence has been obtained to support its relationship to herpes simplex

Since Kaposi's original description in 1887 similar cases were reported by a number of workers, but until recently few attempts were made to establish a virus as a causal agent Freund (1931) found that material from a pustule of one of his cases produced severe keratitis in a rabbit after corneal inoculation but typical Guarnieri bodies, the inclusion bodies of vaccinia could not be found in histological preparations. Freund (1934) produced similar lesions in a rabbit, and serial sections of the cornea revealed typical Guarnieri bodies. Fruhwald (1934) obtained negative results from rabbit inoculation and histological examination.

More recent investigations by American workers suggest that in some cases *at least* the virus of herpes simplex is responsible for the eruption and that its severity and generalisation depend upon the atopic state. Brain and Lewis (1937) produced lesions in the plantar skin of guinea pigs and kerato-conjunctivitis by passage in five rabbits. The negative histological findings and failure of further attempts at passage did not point to infection with herpes virus nor could any definite evidence of infection with vaccinia virus be obtained. The Glasgow epidemic described by McLachlan and Gillespie was not investigated from the virus aspect but from bacteriological studies evidence was submitted implicating streptococci as the possible causal agent. Streptococci were also found in the case of Brain and Lewis.

The clinical picture of Kaposi's varicelliform eruption is very characteristic, for after a brief period of malaise and variable fever an eruption of rapidly developing umbilicated pustules, very suggestive of variola, appears on the face, neck, limbs and may be sparsely scattered on the trunk. Considering the extent of the eruption, the constitutional disturbance is far less than would be expected in variola although high fever, severe toxæmia and fatal issues have been reported and occurred in one of our cases. Another feature of the disease is the tendency of the lesions to become confluent and impetiginised with considerable œdema which is often especially marked on the face and forearms. The cervical and axillary glands are markedly enlarged in such cases.

Serum from herpetic subjects should be given early with measures to improve the general condition, reduce pyrexia and relieve irritation and sleeplessness. Penicillin or a sulphonamide may be needed to control the secondary infections. For local applications the dyes or penicillin cream or spray may be used and when the eruptive phase has passed in two or three weeks the usual remedies are required for persistent eczematous lesions.

REFERENCE—J. W. TEDDER, *Arch. Derm. & Syph.*, 1936, 34, 1006. R. T. BRAIN and BEATRICE LEWIS, *Brit. Journ. Derm. and Syph.*, 1937, 49, 531. SULZBERGER, 1943 *Year Book of Dermatology and Syphilology*.

Foot and Mouth Disease

An infectious disease of cattle communicable to man and characterised in the human subject by a vesicular eruption on the lips and in the mouth and on the fingers.

Etiology. The virus of foot and mouth disease is transmitted by milk in about 63 per cent. and in 34 per cent. by contact with cattle, milking, etc. In a small percentage butter, cream and other milk products have been identified as the vehicle. In rare instances direct infection of wounds has been recorded. Transmission from one human being to another is rarely, if ever, seen. The virus passes through a Berkefeld filter.

Clinical features. The incubation period is from two days to a fortnight. The eruption consists of vesicles resembling herpes, which appear on the lips, palate, buccal mucosa and tongue, and later on the fingers. There may be a profuse nasal discharge. Statistics of 100 cases showed that in forty-six the vesicles were limited to the mouth and twenty-seven had lesions on the extremities. A moderate degree of pyrexia with headache and malaise may precede the eruption. Gastro-intestinal complications are more common than affections of the pulmonary system. Renal

and liver complications are rare. There may be a prodromal or concomitant generalised erythema. The blood count shows eosinophilia as in scarlatina. In Boyle's case there was evidence of affection of the aortic valve.

Local inoculation of the hand may take the form of an indurated haemorrhagic nodule.

Diagnosis. Foot and mouth disease may be confused with aphthous ulcers of the mouth, with herpes and with mercurial stomatitis. Professor MacFadyean suggested that it is not improbable that some outbreaks of epidemic stomatitis are of this nature.

Course. Foot and mouth disease in man usually runs a mild course and recovery takes place in from eight days to a month. It is rarely fatal except in children.

Treatment. The usual measures for the treatment of an acute fever are necessary. The patient requires plenty of fluid and water may be given per rectum. Salvarsan treatment has proved of service.

Herpes simplex (Herpes labialis. Herpes genitalis)

(Gk. *herpo* I creep)

An acute eruption of grouped vesicles on an inflamed base occurring on the lips, nostrils, or other parts of the face, on the genital organs, buttocks, nipples, and mucous membranes, but very rarely elsewhere.

Etiology. Herpes simplex is due to a virus and the indisputable evidence of the fact may be summarised as follows: bacteriologically sterile vesicle fluid is infective. Guinea-pigs and rabbits are readily susceptible and they develop characteristic vesicles and pustules after experimental infection and the virus may be passed in series. Immunity develops after infection or after the inoculation of killed virus, and specific antibodies can be detected in the serum. The virus picture is completed by the presence of minute intra-nuclear bodies in the lesions and these bodies have been seen to increase in size, coalesce and form the inclusion body.

The lesions of the so-called symptomatic herpes present identical clinical and histological pictures, and virus is found just as readily as in the vesicles of the idiopathic type. The relationship between the two types becomes apparent if one considers the life cycle of herpes. Good grounds exist for believing that the ubiquitous virus of herpes infects the majority of infants early in life when the invasion becomes manifest as an aphthous stomatitis or escapes notice. In either case the virus often establishes itself in the cells of the buccal, nasal or conjunctival mucosa and some 70 per cent. of individuals become carriers. This is not mere conjecture for the virus has been recovered from the lesions and sites mentioned and it is reasonable to assume that the presence of the virus accounts for the persistence of herpes antibody in the serum, a fact reported by a number of independent workers, whose results by different methods are in fair agreement.

Although herpetic antibody is constantly present in these carriers one must assume that at times it falls below the level necessary to inhibit the pathogenic activity of the virus. Production of antibody may be affected

by some systemic disturbance or by intercurrent infection, examples being the recurrent herpes of menstruation and the so-called symptomatic cases Herpes is thus associated with disease of the middle ear and of the sinuses and it is common at the onset of pneumonia, cerebro-spinal meningitis, coryza, influenza and febrile states such as malaria. J D Rolleston has commented on its comparative rarity in typhoid and small pox. Labial herpes may be caused by administering trilene (trichlorethylene) as an anæsthetic in a closed circuit, when it is associated with trigeminal and other palsies That the antibody level is a factor in such cases is indicated by the cessation of recurrent herpes after raising the antibody titre by (1) successful auto-vaccination from early herpes vesicles (2) a course of formalised herpes vaccine prepared from herpetic lesions in the guinea pig The failures of these methods are probably explained by the discovery that tissue immunity is not entirely dependent upon the presence of specific antibody in the circulation Epidermal cells often appear to be sensitised by an attack of herpes or perhaps they also carry the virus, for the same area is often the site of a recurrence, provoked by local irritation such as exposure to sunlight cold or trauma. A septic focus or a metallic dental filling appears at times to be the inciting agent of an eruption of herpes since the removal of focal sepsis or irritation in the nerve area con cerned will often put an end to the recurrent attacks.

How tissue immunity or susceptibility is thus affected by reflex irrita tion is not understood but the problem is not peculiar to virus infections. For instance, in the case of boils and sycosis barbæ the circulating staphy lococcal antibodies may be increased many times by the injection of toxoid and still the skin may remain just as vulnerable to the staphylococcus which is often obtainable in pure culture from the nose. Here, then, is a carrier state associated with immune bodies in the serum and recurrent skin lesions like those found in the case of herpes. The view is some times expressed that the vesicular eruption of herpes is a trophic one resulting from a disturbance of the sensory supply to the skin but this explanation ignores the fact that herpes virus can be detected in the earliest vesicles. No doubt the nerves are involved in the reaction for histologi cally the lesions are similar to those of zoster which primarily attacks the posterior root ganglia and the sensory nerves These structures, however are not seen to be affected in herpes in man, but the virus has been found in ganglia it is more likely that the epidermal cells are first attacked and the virus is therefore called a dermatropic one. Ample evidence exists, however to prove that herpes virus can attack and survive in many other tissues and in experimental animals it has been recovered from most of the organs of the body as well as from the central and peripheral nervous systems The origin of recurrent herpes may be an infected ganglion

Pathology The pathological picture in herpes is typical of a virus infection and resembles that of the vesicular lesions of varicella and zoster Minute acidophil intranuclear bodies occur in epithelial cells, and they have also been noted in the cells of the cornea central nervous system, liver testicle and ovary Apparently these small bodies increase in size and coalesce, and finally occupy the greater part of the nucleus, forming the so-called " inclusion body Some of the affected cells become swollen and show a reticular degeneration, whilst others, possibly irritated

by the virus, are transformed by a process of amitotic nuclear division into large multinuclear cells. The affected epidermis and the adjacent inflamed dermis become infiltrated with leucocytes, and a serous exudation dissociates cells and collects beneath the stratum corneum, forming the vesicle.

Clinical features. There is often a premonitory sensation of heat or tension, which may last for some hours, and then a red spot appears, on which rounded vesicles rapidly develop. The vesicles are the size of a pin's head, and they vary in number from two or three to several dozen. Sometimes they are so closely packed that they become confluent. The contents are usually clear serum, but this soon becomes opaque, the vesicles dry up, and in the course of a week or ten days the yellowish brown scale which is formed drops off, leaving a temporarily red spot. There is no scar Sometimes the groups are multiple and irregularly placed. In a boy of six under our care both auricles and the upper and



FIG. 819. Herpes simplex.

lower lips and the middle third of the tongue were involved. The nearest lymphatic glands are slightly swollen and tender

In very rare instances the serum is replaced by blood.

Herpes simplex occurs on the lips (*herpes labialis*), on the nostrils, or on any part of the face and on the auricles (Fig 819) and in the buccal cavity in infants as aphthous stomatitis. Buccal herpes is very rare in adults. The mucous membrane of the cheeks, palate and tongue may be involved. The vesicles are of short duration but speedily become erosions. Similar affections of the pharynx and conjunctiva occur

Herpes genitalis. In the male the eruption usually appears on the sulcus between the glans and the prepuce. On covered parts the vesicles early become erosions from friction and moisture. The lesions are very superficial, discrete and confluent, forming irregular figures. The eroded surfaces are red and slightly oozing and occasionally covered with a diphtheria-like membrane. They are slightly painful, but there is no induration of the base and, if kept clean, they heal up in a week or ten days. If irritated, for instance, with the silver-stick, they may ulcerate, the healing is delayed, and scarring may result.

In the female any part of the vulva may be affected and in rare cases the vesicles appear on the vaginal wall and on the cervix uteri Occasionally the symptoms are severe there are slight fever and intense pain and œdema From the vulva the eruption may spread to the pubic area and *down the thighs* The ruptured vesicles are covered with a greyish white membrane and the exudation is fœtid The glands in the groin are enlarged and tender and the patient has to be confined to bed These severe cases may last for two or three weeks

Genital herpes often follows illicit intercourse. The breaches of surface due to the herpetic lesions are doubtless a common portal of syphilitic infection.

Diagnosis As a rule herpes about the face offers no difficulty The zoster eruption is more painful and usually occupies a cutaneous segment supplied by the sensory ganglion attacked by the virus. The diagnosis of the genital forms is often of the utmost importance. Herpetic lesions



FIG 820 Gluteal herpes.

are often thought to be chancres, but the absence of induration should exclude syphilis, and the diagnosis can be made absolute by the finding of the treponema Soft sores are more ulcerated, and the bubo which forms tends to suppurate The penile lesions of scabies may be confused with herpes Buccal herpes may be confused with erythema multiforme or pemphigus

The treatment of herpes simplex. Attention should be given to improving the general health of the patient and foci of infection or irritation should be dealt with Drugs have proved disappointing but vitamin therapy may be useful *for it is known that aneurin and nicotinic acid have protective* properties for nerves and skin respectively Local X ray therapy may help in doses of 100 r at 90 K V current 3 ma filter not exceeding 0 3 mm. aluminium.

Once the virus has invaded the epidermal cells it is unlikely that much can be done in a specific way to help but the use of a bland antiseptic lotion *e.g.* 2 per cent of phenol in calamine lotion *will protect the broken* vesicles from secondary pus-coccal infection Greasy applications should

be avoided and spirit paints or collodion reserved for the unbroken skin, otherwise they are apt to inflame and intensify the herpetic lesion.

Recurrent herpes. Fig 220 illustrates a case of recurrent *glutal* herpes. This may occur at the menstrual periods We have also seen a case in which there was a chronic prostatitis. Recurrent herpes of the edge of the *auricle* is occasionally seen and the provocative focus may be very difficult to locate. A recurrent herpes on the cheek in a child seen by one of us ceased upon the removal of adenoids and hypertrophied tonsils. Recurrent herpes following irido-cyclitis has also been observed. In a boy of four Sequeira observed four attacks of herpes on the radial side of the left index finger in fifteen months. The first attack followed pneumonia. In another case the application of radium to the ear was always followed by a herpes of the mental area on the same side Such cases suggest a focus of irritation which should be carefully investigated.

Treatment. The essential point is to avoid further irritation of the skin, and simple lotions or dusting powders are the most comfortable applications Sometimes the eruption may be aborted by applying spirit of camphor or calamine lotion with 2 per cent. of phenol in each. Sedative doses of X-rays (100–150 r) relieve irritation and, if repeated three times at intervals of three weeks, may break the sequence of recurrent herpes. If this latter condition is severe it is worth while attempting to raise the herpes antibody content of the patient's blood between eruptions.

Hruszek (1933) claimed a high percentage of success by vaccinating patients with the vesicular fluid of their own early herpes lesions. If a vesicular " take " on the arm is secured by this means, a further vaccination on the other arm may be tried, but often patients are not seen in the early vesicular stage, and auto-vaccination may fail. Although the viruses of vaccinia and herpes are not closely related herpes is rarely associated with variola so that repeated vaccination with calf lymph has been used in the treatment of recurrent herpes with some success by Barber and others. A safer vaccine method, described by Brain (1936) is the use of a formalised 10 per cent. suspension of herpes infected pads of guinea pigs, but although very successful results were obtained in a few cases of frequently recurrent herpes, in others there were no responses, and specific treatment by any means should be reserved for those cases of recurrent herpes in which the eruptions are frequent, severe, and are not relieved by X-ray therapy and general measures. The discovery and removal of a focus of irritation or sepsis is the simplest and most rational method of treatment, when such foci exist.

Local injections of novocain have been used successfully in recurrent herpes by Tranek and Sidi and others. Nicotinic acid, 50 mg b.d., p.c. from the onset of the eruption appears to be of value in aborting or restraining the eruption.

Zoster Zona. Herpes Zoster

(Lat. *zoster* Gk. *zone*, girdle)

An acute inflammatory affection characterised by an eruption of grouped vesicles upon an inflamed base occupying a nerve area on one side of the body

Etiology Zoster may occur at any age and in either sex. Five cases have been recorded in new born infants

The virus of zoster is distinct from that of herpes simplex and so confusion is avoided if the simple term zoster is adopted. Zoster virus will not infect the usual experimental animals but its presence in the vesicles has been demonstrated by the production of local lesions in young children, some of whom subsequently developed a varicelliform eruption, while some contacts of these experimental infections developed chicken pox and all were subsequently immune to chicken pox. Serological tests have



FIG 321 Herpes zoster (L.2.)

shown that a specific antigen, presumably the virus, is present in the lesions of zoster and chicken pox, with corresponding antibody in the sera. Crossed reactions with these antigens and antibodies indicate that the viruses of zoster and chicken pox are identical or very closely related. Confirmation on a smaller scale was obtained by the agglutination of the elementary bodies of zoster with chicken pox serum and *vice versâ* Yet because of the marked clinical differences between these diseases and their ages of incidence the probable fact of their common virus origin is not generally accepted although the difficulties preventing acceptance appear to have a simple explanation

Thus the virus of zoster or varicella most readily attacks young children

who have no natural immunity as a rule and after an incubation period of fourteen to twenty-one days the characteristic eruption of chicken-pox appears in varying degrees of severity some of the milder cases no doubt passing unnoticed as sub-clinical infections. In either event the virus is widely disseminated throughout the body and must reach the central nervous system where it may persist without causing symptoms for many years. After a short or long interval the dormant virus is provoked to activity by some autogenous factor or as the result of trauma, a toxic drug or another infection. When an external factor appears to account for the eruption the condition is called symptomatic zoster a misleading term because it has been established that these cases are due to a virus and that they differ in no way from the idiopathic variety of zoster The activated virus produces hæmorrhagic inflammatory lesions in a unilateral group of posterior root ganglia with a descending neuritis. This accounts for the pain and hyperæsthesia frequently preceding the characteristic eruption which is strictly localised to the spinal root areas supplied by the affected ganglia. The zoster eruption is apt to be regarded as a trophic disturbance in the skin secondary to the nerve lesions. No doubt a neurotrophic element is present in the skin areas affected but the fact remains that virus is able to attack the skin again, producing a few vesico-papules or an extensive eruption identical with that of chicken-pox. This phenomenon is often reported as zoster and chicken-pox occurring together and is regarded as good evidence that the diseases are caused by different viruses. Actually it is almost certain that the varicelliform eruption is produced by dissemination of the zoster virus and a better name for the condition is zoster varicellosus. The general spread of the virus, which must occur even in the absence of a generalised eruption, makes zoster patients infective and this surely accounts for the many hundreds of instances in which contacts of zoster develop chicken pox after the usual incubation period.

Children seem naturally more susceptible and in our series of cases two children who had been in a ward several months without known contact with varicella, developed chicken-pox two weeks after the admission of an adult with supra-orbital zoster Vesicle fluid from the zoster and chicken-pox lesions was put up with their convalescent sera and perfect crossed complement fixation reactions indicated that the zoster virus accounted for the whole incident. We have seen zoster in patients over eighty years of age with and without a memory of chicken-pox in early life, and, if the idea of the virus remaining quiescent in the central nervous system all these years is difficult of acceptance, consider the equally long latent period that may occur between primary syphilis and its tertiary manifestations. This analogy makes the peculiarity of the unilateral lesion of zoster less remarkable for many neurovascular and gummatous lesions of syphilis are also unilateral.

The virus of zoster may therefore be regarded as a neurotropic modification of the dermatropic virus of chicken-pox and the modified strain is obviously less stable than that of vaccinia which itself is merely a modification of variola virus produced by animal passage. These latter virus strains produce cross immunity and serological tests have shown that the antibodies in vaccinia and variola are apparently identical, as they appear

Etiology Zoster may occur at any age and in either sex. Five cases have been recorded in new born infants

The virus of zoster is distinct from that of herpes simplex and so confusion is avoided if the simple term zoster is adopted Zoster virus will not infect the usual experimental animals but its presence in the vesicles has been demonstrated by the production of local lesions in young children, some of whom subsequently developed a varicelliform eruption, while some contacts of these experimental infections developed chicken pox and all were subsequently immune to chicken pox Serological tests have



FIG. 521 Herpes zoster (L.R.)

shown that a specific antigen presumably the virus is present in the lesions of zoster and chicken pox, with corresponding antibody in the sera. Crossed reactions with these antigens and antibodies indicate that the viruses of zoster and chicken pox are identical or very closely related. Confirmation on a smaller scale was obtained by the agglutination of the elementary bodies of zoster with chicken pox serum and *vice versa* Yet because of the marked clinical differences between these diseases and their ages of incidence the probable fact of their common virus origin is not generally accepted although the difficulties preventing acceptance appear to have a simple explanation

Thus the virus of zoster or varicella most readily attacks young children

to be in the case of zoster and varicella. Yet the relationship between the former diseases is generally accepted while in the case of the latter diseases it is not.

Perhaps a further difficulty in the way of accepting this probable fact is that zoster occasionally gives rise to zoster in a contact and, rarely a small epidemic is reported. This would happen if the zoster virus was strongly neurotropic and reached the brain and central nervous system, as does the meningococcus, without producing an initial systemic infection The event is rare because the virus much more readily reaches the blood stream first and in the absence of immunity would give rise to chicken-pox as already stated Rarely a neurotropic strain appears to become fixed.

These explanations seem to account reasonably for the various clinical manifestations of zoster and varicella.

Epidemic herpes zoster Herpes zoster is rather more frequent in the spring than at other seasons and one commonly meets with pseudo-epidemics suggesting a climatic influence An outbreak of ten cases in prisoners of war at Marseilles was reported by Fuhlrott.

Pathology The actual lesions of herpes zoster are deep-seated vesicles, containing serous fluid, and in rare cases blood. The vesicles are unilocular the base being formed of the papillary layer The cavity is filled with swollen epithelial cells which have lost their prickle processes. The papillæ are swollen and their vessels are dilated The detailed histology is exactly similar to that described in herpes Acidophilic inclusion bodies are present in the nuclei of the cells of the vesicle epithelium, and also in connective tissue cells and capillary endothelial cells of the dermis (Lipschütz) Head and Campbell have shown that not only are the fine terminal twigs of the nerves in the lesions inflamed, but that the larger branches show degenerative changes ten days after the onset of the eruption.

The appearance in the posterior root ganglion cells are similar to those occurring in the anterior horn-cells in anterior polio-myelitis. Head and Campbell found hæmorrhages or destructive inflammation leading to cicatricial changes in the ganglia

Clinical features The eruption comes out acutely sometimes without any premonitory symptoms, and is then noticed by the patient by accident. In other cases it is preceded by slight fever malaise, hyperæsthesia, and pain which may be severe At the onset the lesions are oval or irregular red patches slightly raised above the level of the surrounding skin. After the lapse of a few hours vesicles appear and ultimately cover the whole of each patch. At first they are discrete, but as they enlarge, often run together and form irregular and confluent flat bullæ or blebs. The herpetic vesicle is at first about the size of a pin's head, tense and pearly in colour The fluid is then quite clear but in three or four days it becomes cloudy and even purulent Towards the end of a week the lesion begins to dry up, with the formation of a scab which drops off at the end of a fortnight. Sometimes the spots do not all come out at once, but appear in crops during the first two or three days In rare instances the fluid is hæmorrhagic and severe sloughing may occur

Herpetic vesicles rarely rupture spontaneously but if they are ruptured they present small circular erosions. In some cases permanent scars

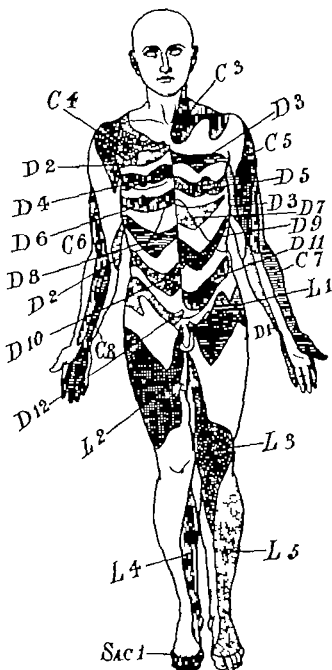


Fig. 222. The areas of herpes zoster (Reproduced by permission of Dr H. Head.)

PLATE 53



HERPES ZOSTER

[T face p [illegible]

are left. Howard Warner demonstrated epithelial cysts in the scar of a frontal herpes, exactly similar to those seen in epidermolysis bullosa and pemphigus. "Glossy-skin" has also been seen as a sequel to zoster.

The *lymphatic glands* are always enlarged and tender and there is an excess of polynuclear leucocytes in the blood.

Aberrant vesicles are not uncommon in severe cases. If numerous the association is often reported as zoster and varicella occurring in the same patient, but is better and more simply designated as "zoster varicellosus."

Pain is a variable feature. It may precede the eruption by two or three days, or longer. It may accompany the eruption, and in old people it often follows it and may be of a severe neuralgic type which is intractable to treatment. Sometimes burning sensations are complained of. The actual area may be anæsthetic, but more commonly it is hyperæsthetic, and in the neuralgic cases in the elderly exceedingly sensitive to changes of temperature.

In a case of frontal zoster *hyperidrosis* was present for several weeks after the healing of the vesicles.

Lymphocytosis of the cerebro-spinal fluid has been demonstrated and Kernig's sign has been observed.

Paralysis sometimes associated with wasting of muscles, has been reported in cases of zoster, *e.g.*, of the ocular muscles, in association with zoster of the ophthalmic division of the fifth nerve, and facial paralysis with geniculate zoster. An interesting case of zoster accompanied by paralysis of the arm was published by Parkes Weber, who gives a number of references to papers on the association of zoster with facial, cervical, trunk and limb paralyses.

Zoster fever is the name given to certain cases in which there is malaise, a temperature running up to 100° or 101° F. with furred tongue, anorexia, etc.

Areas affected (Figs. 322, 323). Intercostal zoster is the commonest (Plate 53). The cervical region is the next most frequently affected. The most troublesome cases are those in which the first division of the fifth cranial nerve is involved—zoster ophthalmicus. The frontal, nasal and palpebral regions are the seat of the eruption, and ocular complications are frequent. There may be conjunctivitis, keratitis punctata, and sometimes perforation of the cornea, and iritis, choroiditis and retinitis. Scarring is common in frontal zoster.

A special feature of herpes zoster is its unilateral distribution. Bilateral cases are very rare. The disease occurs as a rule only once in a lifetime. Sequeira had a patient who had three attacks of zoster at three different levels, all on the right side. He had suffered from hemiplegia for many years. In another case the first attack was at the age of fifteen and the second at the age of eighty. The patient had no obvious disease of the spinal cord.

Diagnosis. The presence of grouped vesicles upon an inflamed base, affecting one half of the trunk in band form, or along one limb or involving the area supplied by one division of the fifth nerve, makes so characteristic a picture that mistakes are very rare.

The sudden onset of pain preceding the eruption over a site such as

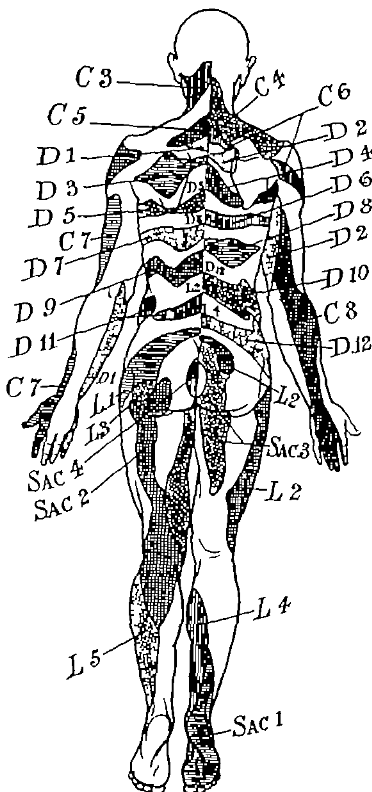


FIG. 823 The areas of herpes zoster (Reproduced by permission of Dr H. Head.)

cellular response to the invader The affected cells and their nuclei become enlarged, and degenerative changes finally destroy their identity leaving collections of molluscum bodies alone; but before this happens a cellular proliferation occurs producing blunt, lobulated downgrowths of the epidermis which elongates and compresses the papillæ so that eventually the latter are represented as thin, fibrous septa between the lobules. In the fully developed lesion a cavity appears near the surface at the centre of the nodule, and gradually extends downwards into each of the lobules this cavity contains the hyalinised "molluscum bodies." The lesion is surrounded by a layer of fibrous tissue, and inflammatory changes are slight or absent.

Clinical features. The lesions are hemispherical papules or flat button-like discs, of a milky white, pearly or pink colour There is a slight depression in the centre of each mature lesion and on compression of the tumour between the thumb nails a semi-solid white mass can be extruded from the orifice. The tumours vary in size from a pin's point to a large pea, or larger There may be a few tumours of varying sizes, or there may be hundreds In rare cases the mollusca become very large (molluscum giganteum), and some years ago Dr Colcott Fox showed such a case in which there was a gradual transition from minute lesions to large growths as big as a small walnut. Mollusca and warts may occur together

The white pasty matter which can be expressed from the tumours consists of the large ovoid cells, which are easily identified under the microscope, and if this material is mixed with saline and smears made and stained for two minutes in hot carbol fuchsin, masses of elementary bodies are visible with a 4 mm. objective

The face, eyelids, and neck and the genital organs are the parts most often affected. The tumours, however may occur anywhere; in the Turkish-bath cases they are usually on the trunk. We have seen them about the nipple (Fig 326).

If untreated, molluscum contagiosum may persist for long periods but there are no symptoms. The tumours increase in number by auto-inoculation. Sometimes, from infection with pyogenic organisms, they swell up and become red and inflamed, and suppurate.

Prognosis. The tumours, if left alone, last for a long time, but ultimately disappear (Hutchinson)

Treatment. The growth should be destroyed with diathermy or galvano-cautery or incised and the contents squeezed out. There is some hæmorrhage, but this is stopped at once by pressure or by swabbing with 80 per cent. solution of trichloracetic acid. Some advocate swabbing out the cavity with tincture of iodine, or with liquid carbolic acid. Small tumours can be emptied by compression alone and subsequently cauterised. Erythema doses of ultra-violet light or X-rays (200 r) are of value, but curettage or cauterisation is more effective. Their disappearance after prolonged treatment with a sulphonamide has been reported.

Verrucæ. Warts

Warts are circumscribed new growths of the skin, due to hypertrophy of the epidermis and papillæ, provoked by a virus infection.

Verruca vulgaris. The common wart is usually seen on the fingers and

fixation reaction and using suspensions of elementary bodies prepared from curetted mollusca, Brain has demonstrated the presence of antibodies in the serum of a patient with multiple lesions. The agglutination reaction was negative.

Pathology. The growths consist of lobules of a pear shape with the apex upwards. They suggest a glandular origin but it is now agreed that they do not arise in the sebaceous glands. The lobules contain masses of ovoid cells of large size derived from the prickle cell layer by a special transformation under the stimulus of the virus. Peculiar histological features were noted by Henderson and Paterson (1841) who were the first



FIG 320. Molluscum contagiosum. Mother affected on the mamma. Child (æt. 2 but still suckled), tumours about eyelids and nose.

to describe certain large oval hyaline bodies which were seen in the superficial layers of the epithelial nodules. These molluscum bodies were thought to be protozoal in nature. In the development of a molluscum, the first cellular changes are seen in the deepest cells of the stratum mucosum. In the cytoplasm of these cells numerous small vacuoles appear with minute peripheral granules (about 0·25μ) and it would appear that these granules are the elementary virus bodies (Lipschütz), for they become numerous and fill the vacuole, and ultimately fuse to form an oval hyaline body which fills the cell and displaces the nucleus. Smears from these hyaline bodies show that they consist of aggregations of minute bodies, and Goodpasture (1927) considers that these elementary bodies are morphologically consistent with a living filter passing micro-organism developing about and within cytoplasmic vacuoles which may be regarded as the

the resulting scar may be tender Another good method is to freeze the wart and a zone of normal skin around it by the firm application of a pencil of carbon dioxide snow for one to three minutes Partial or complete destruction may be effected with the galvano-cautery point or by diathermy Ionisation has proved useful in the case of paronychial warts the lesions are cleaned with ether and then painted several times with



FIG. [illegible]. Verruca plantaris. Female, æt. 14.

liquor potassæ to remove grease, soften the keratin and to increase conductivity of the skin. The fingers are then immersed in a 1 per cent. solution of magnesium sulphate which is in contact with the anode of a galvanic battery and a current of 5 to 10 milliamps is passed for thirty minutes, treatment being repeated once or twice weekly If this fails ionisation with 1 per cent. sodium salicylate may be successful (p. 750). For plantar warts Thomson advises daily soaks for twenty minutes in a 3 per cent. solution of formalin for three or four weeks.

and acid nitrate of mercury are apt to cause severe burns and the following paint is safer for general use —

Phenol ..	10
Glacial acetic acid	10
Salicylic acid	10
Strong tincture of iodine	20
Indust. meth. spirit	ad 100

Another popular prescription is 10 per cent salicylic acid in flexile

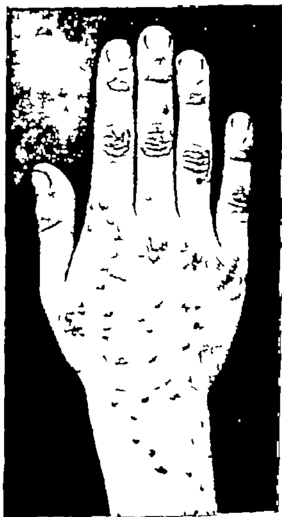


Fig. 328. Verrucae planae

collodion. Successful results may often be obtained by the constant daily application of such remedies, assisted by cautious paring away of the keratin layer. Curettage and cauterisation of the crater is a simple and effective procedure. X-ray therapy has the advantage of being painless, and fractional doses of 100–200 r may be given at intervals of one or two weeks, or a single dose of 600–800 r may be given exactly to the wart, this method being particularly useful in the case of plantar warts. Radium may also be employed, but is not recommended for plantar warts, because

The lesions consist of hypertrophy of connective tissue and dilatation of blood vessels and cellular infiltration.

The treatment consists in scrupulous cleanl ness, the parts being bathed in astringent and antiseptic solutions and then thoroughly painted with 25 per cent. podophyllin resin in liquid paraffin. After six to eight hours the application is removed with oil and soap and water and dusting powders of starch, talc and oxide of zinc are applied. The paint is repeated until a cure is effected. Obstinate lesions require the application of carbolic acid, of the acid nitrate of mercury or removal by the knife, cautery or diathermy

Seborrhœic wart. The seborrhœic wart is a circumscribed,



FIG. 831 Verruca planæ seniles (Seborrhœic warts). Female æt 70.

rounded or oval flat elevation of the epidermis, varying in size from 0·5 to 3 cm or more, and covered with an adherent horny or greasy scale, of a grey brown or black colour On the removal of the adherent covering an irregular or ridged surface is exposed. The lesions are usually multiple and occur on the back and shoulders, on the chest, and about the waist, and occasionally on the forehead and temples (Fig 831).

Both sexes are affected, but this type of wart rarely appears before the age of forty

Pathology The lesions consist of a hyperplasia of the epidermis, with down-growths between the papillæ and probably the majority are the mani festations of a virus infection of a seborrhœic skin. The glandular elements are often atrophic and there is no inflammatory exudation. These tumours

No doubt the occurrence of spontaneous resolution occasionally accounts for a success claimed by the milder methods of treatment above mentioned. This applies to a greater degree when one considers the general methods employed in the treatment of warts and the multiplicity of such methods indicates their unreliability. An old fashioned remedy for warts is 1 ounce of liquor calcis three times a day and it has been claimed that purgative doses of magnesium sulphate are often successful. Other remedies advocated are small doses of arsenic intramuscular injections of mercury salicylate green iodide of mercury $\frac{1}{6}$th to $\frac{1}{4}$ gr t.i.d and autohemotherapy. Numerous methods of treating warts by suggestion are known, and many dramatically successful results have been reported. No reasonable explanation can be given as to how such influences work in so definitely an organic disease, unless one supposes



Fig 330 Section of filiform wart

that emotional stimuli affect natural immunity through the endocrine glands. In some cases at least spontaneous resolution is the probable explanation of the success.

The small filiform warts on the eyelids neck etc., are best treated by excision with a red hot galvano-cautery point or by snipping off the small excrescences with sharp scissors and applying carbolic acid to the base. The hæmorrhage is easily checked by pressure or by 80 per cent trichloracetic acid.

Venereal wart. Verruca acuminata The venereal warts are red or pink excrescences with broad bases or distinct pedicles, occurring about the penis, vulva and anus and sometimes about the mouth. They are usually soft, and grow very rapidly producing soft cauliflower vegetations which may be as large as a walnut. When they occur about the external genitals they are usually associated with an offensive purulent discharge. They are activated by irritating secretions and infection rarely occur in the circumcised and are due to the wart virus as previously mentioned

ports. The women from whom the disease is contracted are usually native prostitutes of the lowest type. Reports from the United States implicate the coloured women in the South as a frequent source. Cases occur inland in Central and East Africa.

Hanschell has found that the disease is exceptional in circumcised males. Lack of cleanliness is undoubtedly a predisposing cause.

The virus. Hellerström and Wassen and Levaditi and his colleagues have demonstrated the virus, and according to Japanese observers it has a diameter of about 0·25 to 0·3 μ. Prof. Bedson informs us that it is morphologically indistinguishable from the virus of psittacosis and trachoma.

Intra-cerebral inoculation of monkeys produces definite histological changes which differ from those caused by the virus of herpes. Brain emulsion from an animal which had died from the effects of the inoculation has been passaged through other animals and on injection has caused characteristic reactions in the monkey. The identity of the virus of "climatic bubo" and that of lymphogranuloma inguinale has been established by many workers. It has further been shown that the unbroken skin is impervious to the virus but that it will pass after scarification.

Clinical features. The incubation period is from three days to three weeks. The primary lesion is usually a small herpetiform vesicle or ulcer. It is circular or lenticular in shape. Multiple lesions are common. The edges are clean and there is a surrounding non-indurated zone of redness. The base of the sore is whitish-grey. An individual lesion may vary from a pin's head to a pea in size. No specific organism can be found in the serum. The primary lesion is usually transitory and heals spontaneously.

In the male any part of the glans and the inner aspect of the prepuce may be the site. In the female the fourchette and posterior wall of the vagina are the areas most frequently involved. As a rule, when the patient comes under observation the sore is healed and there may be *no sign of its previous existence.*

Occasionally the lesion may be a papule from 2–4 millimetres in diameter and circular or oval in shape. There may be a little serous discharge on the surface. In rare cases a nodule is palpable in the body of the penis with a small fistulous opening from which a little whitish yellow or sanguineous discharge may exude. Intra-urethral primary lesions have been observed with the urethroscope.

Lymphangitis may be seen and felt in the dorsal lymphatics of the penis.

The glands. In warm climates the swelling of the groin glands may be observed six days after infection. Usually it does not occur for from ten to twenty-one days. The patient complains of stiffness on walking and then the swelling is noticed. In its early stage the gland may suggest syphilis. The characteristic progress is the extension of the swelling to the whole group of the inguinal and inguino-crural glands, which with the periadenitis forms an oval lobulated hard mass occupying the whole groin. The skin over the tumour is purplish in colour. Bilateral lesions are found in 33 per cent. In about one-third to two-thirds of all the cases the iliac glands are affected. The swelling here may be enormous. Cases are

differ from the senile keratoma and have no tendency to epitheliomatous change.

They are often associated with vascular naevoid lesions on the trunk and with spots of pigmentation

Treatment Salicylic collodion 80 per cent. trichloracetic acid, liquid carbolic acid, mercurial plasters sulphur and salicylic acid *ointment* and even regular application of soft soap sometimes remove the lesions. The application of the solid carbon dioxide pencil with firm pressure for a minute usually removes these warts without difficulty *Radium treatment* is also highly successful and small lesions frequently disappear after electrolysis Barber reports that seborrhoeic warts may respond to *stilboestrol therapy*

LYMPHOPATHIA VENEREA, PORADENITIS ' CLIMATIC BUBO LYMPHOGRANULOMA INGUINALE NICOLAS-FAVRE DISEASE

The various stages of this remarkable affection have been described under a multitude of names and it is only since the classical studies of Durand, Nicolas and Favre in 1913 and subsequently that an adequate *appreciation of its nature* has been obtained It may be defined as a contagious disease, caused by a virus contracted venereally characterised by a small, often transitory primary lesion on the genitals followed by a subacute or chronic reaction in the lymphatic glands with multiple small suppurative foci The local manifestations are associated with constitutional symptoms, fever sweating loss of weight, asthenia, and affections of the joints and reactions in the skin.

Later effects are elephantiasis of the genitalia in both sexes, the condition known as *esthiomène*, the ano-rectal syndrome and rectal stricture.

Etiology The early cases of climatic bubo" occurred most commonly in sailors and followed visits to ports in the tropics The venereal nature was overlooked as the primary lesions were inconspicuous. The disease was attributed to malaria. It is interesting to note that a humid atmosphere favoured the disease for the engine room personnel suffered more than the deck hands. In 1913 Durand, Nicolas and Favre published their study on lymphopathia venerea and the attention thus drawn to the condition, which was also discussed by them at the International Congress in London in 1913, led to the observation that the disease occurs in many European countries and is not confined to the tropics

Both sexes are affected but the bubo type of reaction is commoner in the male than in the female. Native prostitutes in tropical ports are a common source of infection. Cases of *conjugal disease* have been recorded.

Nicolas suggested that women are less susceptible than men and Pautrier hazarded the opinion that the virus might occur as a saprophyte in the vagina It has not been proved that women may be " carriers

The age incidence as might be expected, is that of the highest sexual activity, but cases have been observed in children apparently as the result of simple contact.

Most of the European patients have been seafarers and the reports of naval officers show that many infections occur in Eastern and tropical

whole of the diagnostic outlook and we are enabled by it to recognise that not only the glandular affection but the later manifestations, elephantiasis, the ano-rectal syndrome and rectal stricture are caused by the one virus.

Frei's antigen is prepared from a bubo which has undergone softening but is not fistulous. An injection of 0·1 c.c. is made intracutaneously on the outer side of the forearm, and the injection of a similar quantity of normal saline on the opposite side is used as a control. The result is read at the end of forty-eight hours, not before. A positive reaction is a dome-shaped swelling 0·5 cm. in diameter at least and often more. The reacting inflammatory area can be felt as an infiltration. The antigen usually remains active for several months, but it should be tested from time to time against known cases of the disease. The patient's skin may give the reaction for several years. Hellerström obtained a positive reaction twenty-three years after infection.

Late manifestations. Elephantiasis of the genitalia. In the male the penis and scrotum may swell enormously and the condition may actually simulate filarial elephantiasis. The swelling is hard. Elephantiasis may follow the removal of the inguinal glands by operation. The histology of the affected tissue shows, according to Barthel and Biberstein, a specific reaction to a virus of low virulence.

In the female a similar hyperplasia of the labia majora and minora and the clitoris may occur. Here again the large swellings may simulate filarial elephantiasis. With the affection of the genital area excrescences are often seen about the anus.

It is now recognised that the condition known as esthiomène is caused by the virus of lymphopathia venerea. The elephantiasic condition of the labia and clitoris is present, often with ulceration. The integument has a bluish-red colour. Both the perineum and peri-anal region may be involved. Sclerosis about the urethral orifice may cause stricture. Perforation of the nymphae or the fourchette has been seen and recto-vaginal fistulae may ultimately develop.

Chronic non-ulcerating stricture of the rectum may occur and these strictures are four times as common in the female as in the male. They were at one time considered to be syphilitic, and tabes dorsalis with a negative serum reaction has been recorded as a late phenomenon in lymphopathia.

Esthiomène was classed by some authors as a form of lupus, by others as the result of infection by Ducrey's bacillus or the gonococcus, as well as by the *treponema pallidum*. The grounds for these opinions are now recognised as being inadequate and in the Frei test, which is positive in the large majority of the cases, we have a means of differential diagnosis. The presence of the scars of old glandular abscesses in the groins may help to direct the observer to a correct diagnosis in the absence of opportunities for making the appropriate test.

Treatment. The primary sore rarely calls for treatment, and indeed is often not seen. As the disease develops it is found often to be highly resistant and many forms of therapy have been used. Antimony has now the greatest support. It is given in the form of neo-stibosan. More recently Anthiomaline (antimonio-thiomalate of lithium) has been strongly advocated. It contains 0·01 gramme of antimony per cubic centimetre. Two or three injections of from 1 to 3 c.c. are given weekly. A full course is

recorded in which it has attained the size of a child's head, and pressure symptoms may occur. A special feature of the inguinal adenopathy is the *formation of small abscesses and their opening on the surface by a number of fistulous orifices.* These openings may be from three to thirty in number and the appearance produced by *their multiplicity has been* likened to the rose of a watering-can. It is remarkable that suppuration in the iliac group is uncommon but in rare cases a lumbar abscess has been reported.

The constitutional symptoms vary. In many cases there are fever with rigors and sweating, anorexia, lassitude and wasting. Meningeal symptoms of a transitory nature have been seen.

It is not every case of bubo of this type which goes on to suppuration. In some infections the patient never seeks advice. Large swellings may also undergo complete resolution. Hellerström found that 48 per cent. of his cases passed on to the formation of fistulæ. The fistulæ are curious. There is no ulceration at the orifice and there is neither induration nor undermining of the skin. No granulations form and phagedena is unknown. In rare instances the multiple minute abscesses coalesce to form a big collection of pus. Suppuration may continue for four to eighteen months but it sometimes clears up much sooner.

In addition to the constitutional symptoms mentioned, there may rarely be a general adenopathy and the spleen may show enlargement.

Rheumatic pains are not uncommon and actual arthritis may occur. The cutaneous eruptions are a polymorphic erythema and erythema nodosum. The latter condition often follows surgical interference with the glands. Purpura has also been recorded and phlebitis may be a sequel.

Extra-genital infection is rare, but there have been cases *in which a* surgeon has been inoculated while operating on lymphogranuloma *inguinale.*

Diagnosis. *The primary lesion* has characteristic features which have already been mentioned, but in making a diagnosis care must be taken to exclude syphilis by dark ground examination of the serum, and Ducrey's bacillus should also be looked for. It will be noted that there is no induration but that is not diagnostic. There are no criteria by *which genital* herpes can be distinguished from the primary lesion of lymphopathia. *Herpes is perhaps commoner on the glans.*

The glandular swelling. Any subacute inflammation of the inguinal glands for which there is no obvious cause should demand careful investigation. The history of a transitory genital lesion may suggest the diagnosis especially if this followed a suspicious coitus. When the condition has advanced to the stage in which there is a mass of swollen glands with periadenitis and fistulous openings the diagnosis offers little difficulty. The presence of *swellings above Poupart's* ligament would be valuable confirmatory evidence. Difficulty arises in cases where there have been double infections, *e.g.* with the treponema or Ducrey's organism and the virus of poradenitis.

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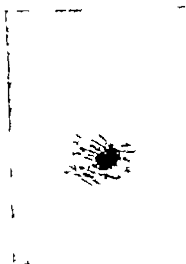




FIG. [illegible]. FIG. [illegible].

The eschar or primary lesion of tsutsugamushi.

frequent. Nervous symptoms, such as headache, restlessness, insomnia, delirium and incontinence are prominent and sedatives are essential.

The tsutsugamushi disease is endemic in Japan, Formosa and Sumatra, and also in the Malay States (*vide* p. 117). No specific remedy is known.

[Fig. [illegible] and some notes are taken from the paper by Fletcher, Lesslar and Lewthwaite in The Transactions of The Royal Society of Medicine and Hygiene, 1929, 22, 161.]

C. E. Ahlm and J. Lipshutz, 1944, *Jour. Amer. Med. Assoc.*, 124, 1095.

twenty injections Large doses of salicylate are sometimes beneficial in the stages before fistulation Pautrier and others speak highly of the effects of X ray treatment

Hanschell had good results with non specific protein therapy using T.A B

Aspiration of the abscesses is recommended and various antiseptics have been used locally It is now considered to be unwise to attempt ablation of the mass of infected glands. The risk of the production of genital elephantiasis is too great

REFERENCES—The original paper of DURAND NICOLAS and FAVRE was published in the *Bulletin Soc Med des Hôp* 1913, 35 274 Their communication to the International Medical Congress, 1913 will be found in the Transactions of the Section of Dermatology 2, 111 H S STANNUS s "A Sixth Venereal Disease. Baillière & Co. 1933 is a very full account *of the various affections. There are over 900 references,* good plates, illustrating cases and histology The report of P CHEVALLIER and a series of papers by various authorities are in the *Bull de la Soc franç de Derm et de Syph.*, Feb. 1930, pp 230–349

Other Virus Diseases

To complete this chapter a reference should be made to other virus diseases which although presenting the picture of general systemic infections come into the province of the dermatologist because they are acquired from the bites of insects For example the diseases of *yellow fever dengue* and *sand fly fever* are transmitted by the bites of dipterous insects and the causative viruses present many similar characters. The first two are transmitted by mosquitoes usually stegomyia fasciata, and the usual vector of the sand fly fever virus is phlebotomus pappataci A second group of virus diseases is the typhus group including the diseases of typhus Rocky Mountain spotted fever trench fever and tsutsugamushi The virus of typhus *rickettsia prowazeki* has been shown to be transmitted by lice as also the virus of trench fever which shows rickettsia bodies similar to those seen in typhus but differing from the latter in that these bodies are found free in the lumen of the gut of the louse As previously described (page 370) Rocky Mountain spotted fever is transmitted by the bite of an infected wood tick which is also parasitic on many animals. Rickettsia bodies have also been described in this disease but there is no cross immunity between it and typhus Tsutsugamushi virus also differs from that of typhus and affords no cross immunity to that disease

Tsutsugamushi Scrub Typhus has features similar to typhus and to Rocky Mountain spotted fever *and is due to a similar virus* for rickettsia like bodies have been found in the skin the lymphatic glands and in the larval mites *Trombiculæ which convey the virus from* rodents to man (p 370) Long grass and dense vegetation naturally favour infection

The *primary lesion is a* small ulcer covered with a black crust and surrounded by a dusky areola producing the eschar (Gk. for fireplace) (Figs 332 333) The scrotum groin areas and ankles are the usual sites.

This is followed by painful swelling of the nearest lymphatic *glands,* a *typhus* like eruption and high continued fever of two or three weeks

duration. A patchy erythematous rash usually appears on the face, chest and abdomen about the fourth day. Severe atypical pneumonia is





Fig. 332. Fig. 333.

The eschar or primary lesion of tsutsugamushi.

frequent. Nervous symptoms, such as headache, restlessness, insomnia, delirium and incontinence are prominent and sedatives are essential.

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CHAPTER XXVII

DERMATITIS HERPETIFORMIS PEMPHIGUS

The name pemphigus signifying blister was formerly widely used and applied to any disease in which the formation of bullæ or blebs is an essential feature The bullous impetigo of infants is still commonly called pemphigus *neonatorum, and the outbreaks of bullous impetigo which* sometimes occur in epidemics are called P contagiosus. The congenital anomaly already described as epidermolysis bullosa is still sometimes referred to as pemphigus traumaticus hereditarius P neuroticus is the name applied to bullous lesions appearing in certain nervous diseases and injuries, while P hystericus is almost certainly due to self inflicted injuries causing blisters "Syphilitic pemphigus" is a term to be avoided, but is sometimes applied to bullous syphilides.

A bullous eruption may occur after the administration of certain drugs, notably the iodides and bromides It may follow vaccination and Bowen described a series of ten such cases with six deaths Sequeira reported a case in which a widely spread bullous eruption was associated with gan grenous appendicitis in a young child Anomalous conditions of this kind are difficult to explain, and the possibility of the eruption being due to *toxic bodies developed at foci of infection or to some unrecognised* virus has to be considered.

In this chapter we propose to describe a group of diseases with fairly well defined characters in which the formation of blisters is the pre dominant feature. It is impossible to classify them satisfactorily in the present state of our knowledge and in a number of cases the relationships are so indefinite that many careful observers prefer to apply the name bullous eruption which has the advantage of being non-committal.

Acute Malignant Pemphigus

A general infectious disease with a bullous eruption occurring in butchers and others who handle dead carcases

Etiology Bulloch found a diplococcus in the fluid from fresh blebs in two cases (Pernet's and Hadley's), and Demme has described a similar organism. It is supposed that the microbe is the cause of the disease.

Clinical features. The disease commonly follows a wound in the hand *or elsewhere and sometimes* the bite of an animal Its onset is marked by rigors a temperature as high as 104 sickness and diarrhœa and there may be delirium.

The primary *lesion may be a whitlow at the site of infection*, but the characteristic bullæ appear at the end of twenty four to forty-eight hours The blisters are at first discrete and tense and the contents are yellow plasma or *blood They come out in large numbers* and may become confluent Early rupture takes place in the flexures and where there is pressure leading to the formation of raw surfaces which are covered by

stinking, decaying epidermis. The mucous membranes of the mouth, tongue, conjunctiva, etc., are involved. The patient is in a prostrate condition, the urine contains albumen, and the symptoms suggest a grave infection, which ends fatally in 75 per cent of the cases. Death occurs in from one to three weeks. In the minority of cases of recovery convalescence begins in from three to four weeks.

Treatment. The disease is obviously an acute infection and repeated blood cultures should be made during hyperpyrexial phases and adequate doses of sulphonamides or penicillin given when indicated. Experimental therapy with these or newer drugs is justified in fulminating cases.

Dermatitis Herpetiformis and Pemphigus Vulgaris

Although these conditions are described as separate clinical entities, and often it is possible to distinguish them, yet many cases occur in which it is impossible to make a diagnosis. It is also likely that hydroa gravidarum is merely a type of dermatitis herpetiformis which relapses under the stress of pregnancy. Thus it may be necessary to make a simple diagnosis of "bullous eruption" and keep the patient under observation until certain clinical features have determined whether the case is dermatitis herpetiformis or pemphigus. This confusion which occurs clinically has been carried over into the etiology because many investigations have been made of these bullous lesions and a number of animal experiments have provided some evidence of a virus infection, equally in each disease.

In a small series, Bedson and Brain were able to obtain positive "takes" in about 50 per cent. of inoculations but most attempts at passage of the virus, and all attempts to isolate it, were failures. Abroad, investigators have claimed a high percentage of successes in the inoculation of animals, but it has been impossible to confirm these results. Further Brain was unable to demonstrate the presence of any specific antigen in the bullous fluid or a corresponding antibody in the patient's serum, although this could be done with relative ease in the case of herpes and zoster. Therefore the evidence that these diseases characterised by the presence of sterile bullæ are due to viruses has not been established, and it is felt that much of the reported work should be taken as referring to the dermatitis herpetiformis-pemphigus group and not to either disease specifically. Indeed, sometimes dermatitis herpetiformis with all its characteristic features appears to pass into pemphigus, and occasionally a case confidently diagnosed as pemphigus settles down into a typical relapsing dermatitis herpetiformis.

Following these general observations we will now describe the characteristic diseases (see also Epidermolysis bullosa, p. 42)

Dermatitis herpetiformis (Duhring's Disease). Pemphigus pruriginosus. Dermatites polymorphes douloureuses (Brocq)

A polymorphic eruption characterised by erythematous, vesicular and bullous lesions attended with intense itching, and with a great tendency to recurrence.

Etiology Dermatitis herpetiformis is comparatively rare It may occur at any age but is more common between twenty and forty Both sexes are equally affected Exposure to cold worry exhaustion and shock are believed to be exciting causes but of its exact nature nothing is known. No specific organism has been found in the lesions and the disease is not contagious but lesions have been produced in rabbits and guinea pigs by the inoculation of sterile bullous fluid. The experimental evidence is by no means conclusive proof of a virus origin of this disease It has been suggested that it is due to a toxæmia, but of the nature of the toxin and whether it is developed within the body or introduced from without, we are ignorant The incidence of the disease has increased during the recent war

Pathology The erythematous patches are congested and œdematous, and there is cellular infiltration of the papillæ The cellular elements

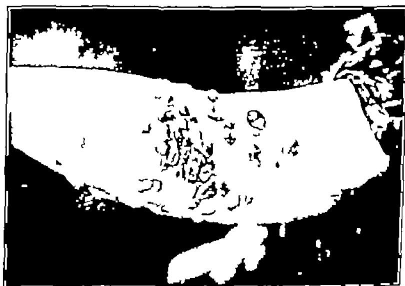


Fig 334 Dermatitis herpetiformis.

show a remarkable excess of eosinophiles. The bullæ are comparatively superficial the roof being formed by the corneous layer or by the whole or part of the epidermis. The fluid in the blebs contains a large number of eosinophile cells and the same cells are found in large numbers in the blood However eosinophilia is a very variable feature of dermatitis herpetiformis and while its presence, if marked, is a helpful sign, normal or moderate degrees of eosinophilia do not invalidate the diagnosis. It should be noted that eosinophilia is a common feature of many allergic or itching conditions and its presence in dermatitis herpetiformis may have no peculiar significance. The fluid from early unbroken vesicles is sterile Infection with the usual skin cocci occurs later There are no visceral lesions which are peculiar and no changes in the nervous system

Clinical features. There are four cardinal features of Duhring s disease —(1) the eruption is polymorphic, (2) it is attended with itching and sometimes with pain, (3) it is recurrent, and (4) the patient s health remains good.

The eruption consists of erythematous patches, usually well-defined, of discoid shape, or with a gyrate outline from the coalescence of several neighbouring lesions. In rare cases there are papules. Vesicles appear on the patches, sometimes in groups like the vesicles of herpes, sometimes scattered irregularly over the surface of the plaque, or forming a marginal ring. The size of the vesicles varies much more than is usual in herpes, bullæ as large as a pea or nut are common. In some cases there are blebs as large as a walnut or larger. Diversity in size of the bullæ (Fig. 831) is frequent. The vesicles and the blebs are not entirely confined to the erythematous patches, but may develop upon normal skin. The fluid in the bullæ and vesicles is clear at first, but it may become purulent, and in some rare cases, of apparently the same type, the fluid is purulent from the onset. Stained specimens of the fluid show a remarkable number of eosinophile cells, which may reach 20 to 90 per cent. of the cell elements present (see Plate 56).

The disease presents many variations, but these depend in the main upon the relative preponderance of the erythematous and vesicular lesions and upon the varying size of the bullæ.

The limbs are the parts most affected, and the forearms, perhaps, more than other parts, but no region of the skin is exempt. Buccal lesions are not rare. The eruption tends to come out in crops, but the duration of any one lesion is limited. The red areas become pale, the vesicles and bullæ rupture and dry up to leave moist or crusted spots. On the subsidence of the eruption pigmented stains are left, but scarring only occurs if the parts are severely scratched. Sometimes the chronic phases are manifest by a symmetrical but patchy eruption of small split pea-sized itching papules. These may arise on any part of the body but especially about the axillary and pelvic regions, the elbows and knees, thus simulating scabies from which the differentiation may be difficult.

Subjective symptoms. The itching is intense. The Vienna school refusing to separate the disease from true pemphigus, call it pemphigus pruriginosus. The pruritus may precede the eruption. It is always worse at night, and may be extremely distressing to the patient. Sometimes the affected areas are terribly excoriated by scratching, which ruptures bullæ and may relieve itching. Burning and pain may occur.

General symptoms. The itching and pain may prevent sleep, and with the attacks there may be febrile phenomena, and sometimes diarrhœa, but there is no general wasting as in chronic pemphigus. In several cases we have examined the urine over long periods, but have failed to find the hypoazoturia which is described as occurring in this as in other members of the pemphigus group. A variable feature of some importance in the diagnosis, is the excess of eosinophiles in the blood: a percentage of 10 or 15 is common, and may be as high as 80 per cent. Indicanuria may also occur.

Course. An attack may last for several weeks, or it may go on for a twelvemonth or more, and then the patient will probably have a period of freedom, which may, however, be of only a few weeks' duration or last several months. Psychological stresses appear to account largely for the waxing and waning of the disease. In some cases the eruption recurs throughout life, but the intervals between the attacks gradually lengthen.

A duration of ten to fifteen years is not uncommon. In rare instances Duhring's disease passes on to pemphigus foliaceus and still more rarely vegetating lesions develop (*vide* pemphigus vegetans). Dermatitis herpetiformis is one of the most distressing of skin diseases; it unfits the patient for long periods from pursuing his avocations, but it is not dangerous to life, and death only occurs from intercurrent disease.

Diagnosis The intense itching and the fact that the blisters tend to heal easily without much discomfort to the patient and the maintenance of the general health serve to distinguish dermatitis herpetiformis from common pemphigus. A marked eosinophilia is also a useful guide. The symptoms are seriously aggravated by iodides internally and react locally to 20 per cent. sodium iodide in soft paraffin which may be applied as a diagnostic test. Bromides may act similarly but are less potent. In urticaria with bullæ and in erythema bullosum the vesicular and bullous elements are not grouped and are obviously an epiphenomenon. In erythema there is also less itching. Hydroa æstivale is located in the areas exposed to sunlight and commonly ceases about puberty. Chronic scabies with vesicular and bullous reactions may simulate dermatitis herpetiformis and so may a bullous urticaria of childhood, which is by far the more common of the two.

Prognosis Under appropriate treatment most cases get well in a few weeks to several months, but there is in all a great tendency to recurrence. There are patients, however, who are rarely free from some degree of eruption for years. If pemphigus supervenes it is often fatal.

Treatment In the acute attacks the patients must be kept in bed and put on a milk diet. With the milder form of the disease patients are able to pursue some occupation of a not very exacting character. Arsenic in increasing doses, pushed to the limit of toleration, has a controlling influence upon the eruption, and salicin (15 to 30 grains thrice daily) as suggested by Dr Radcliffe Crocker has been used with advantage. We have found surmmin (0.5–1 gm. intramuscularly or intravenously) useful in many cases. Good results have been claimed after treatment with large doses of calciferol, vitamin D_2 (150-000–300-000 units a day being given for months). Penicillin has been tried, but in our experience no specific remedy is known and general treatment on simple psychological lines is important. A course of sulphapyridine is often effective and small doses of sulphonamides over a long period may control the condition but only during treatment, which must be suspended if leucopenia develops.

Shock therapy and pyretotherapy often favourably influence a refractory case and may secure a long remission. Injections of whole blood, aolan, T.A.B. vaccine and sulphur preparations may be given for this purpose. The other measures suggested for the treatment of pemphigus may also be used.

Sulphur baths and ointments containing sulphur are generally very valuable. The B.P. sulphur ointment may be used. Where, however, the blister formation is very extensive it is better to use dusting powders of zinc and starch or talc. The lotion of the glycerol of lead and calamine liniment are also useful for the treatment of large denuded surfaces. If the itching is very severe 5 per cent. of liq. carbonis detergens may be added to the lotions. X rays and U.V.L. are of some service.

PLATE 54

[illegible] [illegible] [illegible]

Polymorphic [illegible]ruption [illegible] erythema, vesicles and bullæ.

[illegible] face p. [illegible]

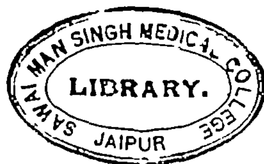


PLATE 5



PEMPHIGUS

Femal aged 52. The photograph show bullæ and ruptured bullæ on the flank. The lower part i somewhat obscured by zinc ointment

[To face p. 840.

Hydroa gravidarum (Hydroa gestationis) (Gk. *hudor* water)

Hydroa gravidarum presents the same phenomena as dermatitis herpetiformis and may be the same disease provoked by the toxæmia and psychological stresses of pregnancy. It commonly occurs between the third and the sixth months of pregnancy and often recurs with each successive pregnancy and sometimes after delivery. As a rule the severity increases with each attack. Eosinophilia occurs in hydroa gravidarum as in Duhring's disease. It will be remembered that the urine of pregnant women has a high degree of toxicity and rapidly causes death when injected into animals.

The treatment and general management are the same as in dermatitis herpetiformis. Recently great benefit is recorded as following the injection of 10 c.c. of inactivated serum made from the patient's own blood. In severe cases the question of terminating the pregnancy may require consideration.

REFERENCES.—H. FRENCH. Goulstonian Lectures. *Brit. Med. Journ.*, May 2, 1908, p. 1029. Auto-serum therapy. Discussion on. *Journal American Med. Assoc.* 1914, 63, 1103.

Hydroa puerorum (Unna) and Hydroa æstivale (Hydroa vacciniforme of Bazin, also called Hutchinson's recurring summer eruption) should not be regarded as varieties of dermatitis herpetiformis. They have already been discussed among the diseases believed to be caused by the irritation of the sun. They begin in infancy or early childhood as red spots upon which appear round vesicles in groups. The uncovered parts are affected and the disease tends to disappear about puberty (*vide* p. 812).

Hydroa vacciniforme leaves scars.

Pemphigus neonatorum is a bullous impetigo of the newly-born and is considered on p. 445.

Pemphigus chronicus

True pemphigus is a progressive disease characterised by the formation of blisters upon healthy skin. It is slowly progressive and often fatal.

Etiology. The patients are usually debilitated subjects over forty years of age. At the London Hospital an equal number of men and women are admitted to the wards, though Kaposi gave the proportion as three males to one female.

Pemphigus is not contagious, and no organism has yet been discovered which is specific to the disease. Worry, anxiety and the like appear to predispose to the affection. Parenchymatous changes in the spinal cord have been described, and it has been suggested that the disease is a toxæmia primarily acting on the nervous system and secondarily affecting the skin.

Pathology. The bullæ are formed as the result of the inflammation of the papillary layer with exudation of fluid. Sections of a bulla show that its roof is formed in some cases by the horny layer and in others by the Malpighian layer. The dermis is œdematous, but there are few migratory cells. There is no excess of eosinophiles as in dermatitis herpetiformis.

Clinical features. The eruption may first appear on the lips or in the mouth or on the front of the chest, and occasionally on other parts. It

should not be forgotten that the disease may be localised on the mucous membrane of the mouth or eye for as long as six to eighteen months before affecting the skin The lesions are round or oval blisters about a quarter of an inch to an inch in diameter They are usually *tense*, but *may* be flaccid. Their contents are clear serous fluid, which at the onset is always sterile There is no excess of eosinophile cells in the fluid of the blebs as in dermatitis herpetiformis, pemphigus foliaceus and pemphigus vegetans

The bulla makes its appearance on healthy skin, but after the lapse of a



FIG 533 Pemphigus. The photograph was taken early in the case which ultimately proved fatal

few hours there is a red halo and the lesion may suppurate. In blebs of even the second day both staphylococci and streptococci are commonly found. Whether the bullæ are allowed to rupture or not they tend to dry up and form crusts which fall at the end of a week or ten days, leaving a brownish stain. *The individual lesions do not increase in size* but numerous fresh blebs appear sometimes in crops though the development of crops is not nearly so marked a feature as in Duhring's disease In advanced cases the abraded surfaces left by the bullæ do not heal well and raw or scabbed areas with gyrate outlines are left These are often

surrounded by groups of fresh blebs. In this way large areas of the trunk and limbs may be affected, and in course of time the eruption may become general. Occasionally the bullæ contain blood, and in some instances the base may ulcerate especially where there is friction or pressure. In the flexures, the neck, the axillæ, groins and the anal and genital regions large raw areas sometimes covered with a diphtheroid membrane are seen, and actual gangrene may occur. In one case large intramuscular abscesses formed in each thigh. Pure cultures of streptococci were obtained from the pus (see Plate 87).

Nikolsky's sign. If the pulp of the finger be pressed on the skin the corneous layer of the epidermis can be made to slide on the subjacent layer and the pressure produces a bulla. This sign is not peculiar to pemphigus, but occurs sometimes in dermatitis herpetiformis and in epidermolysis bullosa.

The *mucous membranes* are often affected in pemphigus. As already mentioned, the mouth may be the first part to be attacked, but at all stages bullæ are common on the buccal mucosa, on the palate, tongue, and pharynx. Their early rupture leads to the formation of white patches which resemble the lesions of diphtheria, or ulcerative stomatitis. The lips are also affected. The mouth becomes very foul, and the taking of food may be extremely difficult and painful. The mucous membrane of the nose and the eyes and the vulva may be similarly involved. In one of our cases the ocular symptoms were curiously severe in proportion to the cutaneous eruption. The patient lost the sight of one eye and there was "essential shrinking" of the conjunctiva. In rare cases an affection of the eyes of similar type occurs without any cutaneous lesions whatever. It is, however, doubtful whether this condition is pemphigus.

Subjective symptoms. There may be no itching or burning and the lesions are only painful when the surfaces are abraded from the rupture of the blisters. The buccal condition is extremely painful and causes much suffering.

General symptoms. The patient rapidly wastes, and there is loss of appetite and depression. The temperature is elevated at the onset and with the successive outbreaks. Ulceration and sloughing and the formation of abscesses tend to prolongation of the pyrexia. Vomiting and diarrhœa occur and albuminuria and grave hypoazoturia are common symptoms. The patient frequently dies in from three to eighteen months. The disease may pass on to pemphigus foliaceus (*vide* p. 634). Benign cases are seen, especially in children, but there is some doubt whether they are cases of true pemphigus. The curious cases in which a solitary large bulla develops, so-called "pemphigus solitarius," are not of this type, but their true nature is unknown. In all probability they are due to coccogenic infection.

Diagnosis. The first point that the student must recognise is that all bullous eruptions are not pemphigus. The most common bleb eruption is caused by pus-cocci, a bullous impetigo, and sometimes this may be extensive enough to raise a suspicion of pemphigus. In fact the bullous impetigo of the newly-born is called pemphigus neonatorum. It usually clears up rapidly with mild antiseptic treatment. The second common disease to present large bullæ is urticaria, especially in children, in whom

true pemphigus is extremely rare Erythema multiforme bullosum is a third disease more common than pemphigus and it should be remembered that common diseases *most commonly occur* Dermatitis herpetiformis is differentiated by the polymorphism of the eruption and the intense itching together with the tendency to the formation of herpetic groups and eosinophilia Epidermolysis bullosa dates from early infancy and bullous impetigo of the infant occurs during the first two weeks of life and rarely later It must also be remembered that some drugs, and particularly iodides cause bullous eruptions No reliance can be placed upon bacteriological examination of the contents of the bullæ unless the lesion is quite recent. All bullæ become secondarily infected with pyogenic cocci from the skin within a few hours certainly by the second day The bullous eruptions in certain nervous diseases may resemble pemphigus but they are not likely to cause trouble in diagnosis as the nervous phenomena are pre-eminent and the skin affection is subsidiary In hysterical girls and



FIG 330 "Pemphigus solitarius. The bulla depicted was the sole lesion. The affection is probably of coccal origin

women bullous eruptions are met with from time to time, but there is grave doubt whether there is such a thing as pemphigus hystericus in the strict sense. Where such an eruption occurs the patient should be suspected of applying local irritants. For an account of such a case see p. 209

Prognosis. *True pemphigus is a grave disease* and in thirty patients admitted to the London Hospital with this diagnosis nineteen died in the wards and this does not complete the tale of mortality because some of the cases ran a very chronic course, and were transferred to the infirmary or went home to die. It is exceedingly difficult at the onset of the disease to say *whether it is going to develop into the grave type* and a very guarded prognosis should always be given. In this country the outlook appears to be slightly more favourable than in the Continental clinics. A fatal infection may occur after recovery from pemphigus

Treatment. Until a specific remedy has been found treatment should follow the lines suggested for dermatitis herpetiformis (p. 648). We have not found suramin so valuable in pemphigus as in dermatitis herpetiformis. Oppenheim (1948) reported good results with acetarsone 8–12 gr o.m. for three days with three days intervals

Barber recommends prolonged courses of stovarsol in doses of 6 grains o.m. and 4 grains o.n. for three days and then three days interval before repeating the same dosage. Blood transfusions are valuable in supplying natural antibodies and in correcting the secondary anæmia. We have rarely seen much benefit from large doses of calciferol but ascorbic acid, 100 mgms. with each meal, probably helps to restore the buccal mucosa and combats the toxæmia. Penicillin injections have controlled the fever and reduced the secondary infections in some of our cases, but appear to have no influence upon the bullous eruption. Small doses of quinine sulphate after meals improve the appetite and the tone of the intestinal muscles. These measures combined with constant encouragement maintain the patient's morale, failing which the severe toxæmia and intense depression make the prognosis almost hopeless.

The patient must be confined to bed, the parts being protected with dressings and powders. Zinc oxide and starch or talc with addition of boric acid, form a useful powder. More generally it will be found advisable to wrap up the affected area in lint soaked in glycerol of lead lotion (glycerol of lead, one ounce; glycerin, one ounce; water, one pint). The watery solutions of the dyes inhibit secondary infection and reduce the offensive odour of the purulent lesions which is often an unpleasant feature of pemphigus. Two per cent. of eucalyptus oil may be added to a cream or ointment to mask the odours. In some cases the eruption is inhibited while the patient is on small doses of the sulphonamides. Calamine liniment is another soothing preparation (calamine, thirty-five grains; ol. olivæ and aq. calcis, of each half an ounce). The large abraded surfaces may be dressed with boric acid ointment spread upon lint. Prolonged immersion in warm saline baths kept at an even temperature (about 100° C.) is comforting, and tends to cleanse the surface, but the patient requires careful watching for the onset of syncope while submitted to this form of treatment. Permanganate is useful in the bath.

The diet must be as supporting as the patient can take but the foul condition of the mouth is often a great trouble, and requires constant attention. An anæsthetic spray or lozenge may be necessary before meals. The buccal cavity should be swabbed out frequently with a lotion of equal parts of peroxide of hydrogen (10 vols.) and boric acid lotion.

The benign type of pemphigus. The Senear-Usher type of pemphigus. In 1926 Senear and Usher described a group of cases of pemphigus of unusual type. They were characterised by two clinical features, one suggesting seborrhoeic dermatitis or lupus erythematosus and the other presenting the characters of pemphigus. They ran a benign course. The eruption on the face resembled discoid lupus erythematosus or a severe seborrhoeic dermatitis but on the trunk and sometimes on the limbs was a symmetrical eruption which began with bullæ. The bullæ were usually flaccid and affected the areas involved in seborrhoeic dermatitis. The bullæ rapidly dried up leaving a greasy seborrhoeic dermatitis. Under the scabs were found raw reddish, denuded areas, which healed rapidly. One of us (J. T. I.) has studied two cases of this syndrome and believes it to be a mild pemphigus in a seborrhoeic subject.

REFERENCE.—J. T. Ingram, *Brit. Journ. of Derm. & Syph.*, 1933, 45, 283

true pemphigus is extremely rare. Erythema multiforme bullosum is a third disease more common than pemphigus and it should be remembered that common diseases most commonly occur Dermatitis herpetiformis is differentiated by the polymorphism of the eruption and the intense itching together with the tendency to the formation of herpetic groups and eosinophilia Epidermolysis bullosa dates from early infancy and bullous impetigo of the infant occurs during the first two weeks of life and rarely later It must also be remembered that some drugs, and particularly iodides cause bullous eruptions No reliance can be placed upon bacteriological examination of the contents of the bullæ unless the lesion is quite recent All bullæ become secondarily infected with pyogenic cocci from the skin within a few hours certainly by the second day The bullous eruptions in certain nervous diseases may resemble pemphigus, but they are not likely to cause trouble in diagnosis as the nervous phenomena are pre-eminent, and the skin affection is subsidiary In hysterical girls and



FIG 836 "Pemphigus solitarius. The bulla depicted was the sole lesion. The affection is probably of coccal origin

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it is remarkable how long strength is maintained. Sulphonamides have been found of service and one of us (J T.I.) has given them over long periods without deleterious effects. He has also been impressed with the value of the local application of vitamins. Prolonged immersion in warm baths affords more comfort than any other measure. Failing these, the local applications mentioned under chronic pemphigus should be used.

We have not found that arsenic in any form or stramin, calciferol or cysteine is of constant value in this disease.

Pemphigus vegetans

This exceedingly rare disease is characterised by the formation of bullæ, at the base of which vegetations rapidly develop.

Etiology Nothing is known upon this point. The disease is exceedingly rare, only one case having been seen at the London Hospital for many years. It occurs in adults, and is probably a true pemphigus with a super added infection, giving rise to that peculiar exuberance of purulent granulations which was described by Hallopeau as "pyodermite végétante" (see p. 461). The bacillus pyocyaneus has been found in the lesions and in the blood, and pyogenic cocci and diphtheroid organisms have been isolated.

Pathology The early lesions do not differ in any respect from the bullæ of common pemphigus. In the vegetative period, excrescences may attain one-fourth to one third of an inch high. They consist of a very thick mucous layer with numerous minute abscesses crowded with polymorph leucocytes and many eosinophile cells. There is no excess of eosinophiles in the blood. Pathological changes have been found in the central nervous system and in the viscera, but they are inconstant.

Clinical features. In one-half of the cases the eruption begins in the mouth, nose or pharynx. The genitalia are also frequent sites of origin. In other cases the bullæ begin in the flexures, or about a nail. The onset is often insidious, and in some instances the first symptom is dysphagia from buccal or pharyngeal excoriations due to ruptured blebs. On the skin the bullæ are flaccid, and filled with sero-pus, which dries up to form crusts, and they may heal up in the centre and spread at the periphery In five or six days the bottom of one or more bullæ ulcerates, and a swelling forms. This swelling rapidly becomes papillomatous and secretes a foetid pus, under a brown crust. The lesions look very much like the mucous plaques seen in syphilis. By serpiginous extension and the confluence of the elements, large areas may be involved. Finally the whole body may be covered with ulcerating vegetations, suppurating, foetid and painful. The buccal cavity is the seat of a number of erosions covered with a diphtheroid membrane. There is often fever and death ensues from marasmus in from two to six months. In rare cases in which the disease runs a *benign* course the eruption is limited to the limbs and the trunk rather than the flexures. The lesions closely resemble those caused by iodide. These cases run a mild course without general symptoms, and are greatly relieved by simple bathing In the mild cases there is a tendency to recurrence, and there appears to be the same relationship between them and the ordinary type as between Duhring's disease and true pemphigus.

Pemphigus foliaceus

This variety of pemphigus is characterised by the formation of flaccid bullæ followed by a condition of general exfoliation of the skin. It may be primary but is more frequently the sequel of common pemphigus, and rarely of dermatitis herpetiformis.

Etiology Women are more often affected than men and at the London Hospital the patients were always of Polish or Russian origin. The cause of the disease is unknown It has been variously supposed to be of nervous toxic or hæmatic origin When it supervenes upon common pemphigus, it suggests a superadded infection and it is possible that it may be microbic.

Pathology There is great dilatation of the vessels of the corium. The connective tissue is œdematous and swollen and shows hyaline and colloid degeneration. The glands are atrophic The Malpighian layer shows an elongation of the interpapillary projections. The cells of the rete are swollen and lose their prickles The exfoliation takes place below the stratum corneum or between the layers of the rete or between the rete and corium.

Clinical features The characteristic lesions are flaccid bullæ, but on their rupture there is no tendency to the formation of healthy epidermis, but of lamellar scales which resemble leaves They are usually moist rarely dry and cover red areas. The eruption may involve the entire surface of the body The contents of the bullæ are turbid from the first and speedily become purulent. The corium is left exposed and moist and covered with a fœtid muco-pus The epidermis splits into lamellæ and there are fissures between the scales producing a peculiar tessellated appearance Nikolsky's sign is present There is little itching or burning as a rule but in some cases they may be severe. The hair may fall and the nails are atrophic and may be shed. The epithelium lining the buccal cavity and pharynx is destroyed and the mouth is in a foul, painful condition

The temperature is rarely raised above 100 F The patient becomes extremely emaciated, and, on the whole, the disease runs a progressive course, but from time to time there may be intermissions in the severity of the symptoms, and parts of the skin may heal up but in from two to three years, or sometimes much longer pemphigus foliaceus ends fatally by general asthenia, diarrhœa, or some intercurrent disease. Uræmia may close the scene In this connection it is of great interest to note that grave hypoazoturia is common In one case the urea excreted was for many weeks under 1 per cent and was once as low as 0 4 per cent.

Diagnosis. Pemphigus foliaceus has to be distinguished from the erythrodermias in which there is general exfoliation but these have no flaccid bulla formation. It may be difficult to differentiate these affections but any case of general exfoliative dermatitis which tends to be moist should raise the suspicion of pemphigus foliaceus. Dermatologists of experience recognise a peculiar odour in the disease. Generalised eczema is rarely if ever complete and careful examination will show the absence of bullous formation

Treatment. The feeding of the patient may present difficulties but

GROUP 6

ATROPHIC AND HYPERTROPHIC DERMATOSES TUMOURS OF THE SKIN

CHAPTER XXVIII

ATROPHIC CONDITIONS OF THE SKIN INCLUDING AINHUM

Atrophodermia. Atrophy of the skin

ATROPHY of the skin is characterised by loss of substance of the whole thickness of the integument, or of some of its components.

Etiology Atrophodermia may be primary or secondary

Secondary atrophy may be caused by—

(1) Injury traumatism, wounds, burns, scalds, the application of caustics, X-rays, and radium, and exposure to light, tar pitch, etc

(2) Congenital anomalies, xerodermia pigmentosa, and epidermolysis bullosa.

(3) Certain acute specific fevers, variola, vaccinia, varicella.

(4) Bacterial infections acne vulgaris, and other suppurative lesions of the follicles ulcers due to syphilis, tuberculosis, leprosy etc.

(5) Favus of the scalp.

(6) Diseases of the nervous system herpes zoster glossy skin, syringomyelia, and nerve leprosy

(7) Certain interstitial affections of the skin without actual ulceration lupus vulgaris, lupus erythematosus, lichen planus atrophicus, lichen sclerosus vel atrophicus, morphœa, sclerodermia and necrobiosis lipoidica diabeticorum.

(8) Hydroa vacciniforme and occasionally pemphigus and dermatitis herpetiformis.

(9) Stretching of the skin as in striæ atrophicæ

(10) Senile degeneration.

The primary or idiopathic atrophies are of unknown origin They may be diffuse or macular Their special characteristics will be described in this chapter

Pathology In all cicatricial atrophies the essential changes are in the true skin, or at least in the papillary body The epidermis may be thinned or thickened, and there is often irregularity causing special characters of the surface. Under the epidermis lies a dense connective tissue with a deficiency in the elastic fibres. The papillæ are usually absent, the vessels are diminished in number and the usual arrangement of the plexuses is lost. In some cases, particularly in xerodermia pigmentosa and atrophic radiodermatitis, there are telangiectases. Many

Treatment. Hutchinson advocated the internal administration of opium in pemphigus vegetans. The foul condition of the surface requires the application of mild antiseptics such as boric acid, peroxide of hydrogen, or ointments of peroxide of zinc, 10 to 40 grains to the ounce. Continuous irrigation with saline and hypochlorite is valuable. Sulphonamides internally and as a powder dressing may be tried and penicillin should be a valuable remedy here X ray therapy in doses of 100 r weekly for three or four weeks is useful.

REFERENCE—R. T BRAIN Viruses in the Etiology of Skin Diseases. *Brit Med Journ* 1930 1 034

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cicatricial atrophies are characterised by absence of pigment in others there is irregular or excessive pigmentation. The hairs, sebaceous glands, and sweat glands are destroyed to a greater or less extent. In some instances especially in some forms of epidermolysis bullosa, pemphigus, and rarely herpes there are solid epidermal cysts in the cicatrices

The pathology of the primary atrophies is considered below

Congenital atrophy Developmental anomalies characterised by atrophy of the skin are rare They may be localised or widely spread. The pilo-sebaceous elements and the subcutaneous fat are absent.

Striæ atrophicæ

Striæ atrophicæ are linear streaks of atrophy of the skin caused by stretching and occasionally by other conditions. Some appear to be nævoid.

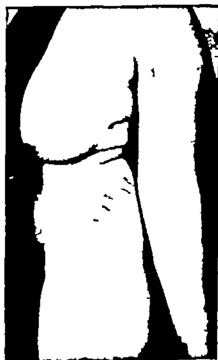


Fig 337 Striæ atrophicæ in obesity

Striæ atrophicæ are most commonly the result of pregnancy where they occur on the abdomen and upper parts of the thighs and buttocks and on the breasts. Obesity and occasionally swelling of the joints may cause them, but it must be noted that the striæ do not follow every kind of distension of the skin. They are not seen over tumours or in ascites nor after extensive hæmorrhages or dislocations, nor on herniæ Moreover they occasionally appear after enteric fever influenzal pneumonia and other conditions attended with pyrexia and in cachexia due to malignant disease. Apparently there must be some predisposition on the part of the patient. Though exceedingly common in women who have borne children one occasionally meets with a patient who has had a large family in whom they do not develop It would appear that the pituitary gland has a potent influence upon striæ formation for the lesions are part of Cushing's syndrome which depends upon basophilic adenomata of the anterior pituitary

The epidermis and the papillæ are shrunken, and the connective tissue of the true skin is atrophic, but the special characteristic is the disappearance of the elastic tissue.

Striæ atrophicæ are streaks from a fraction of an inch to several inches in length with a wavy outline. At first bluish or purplish in tint they become pearly white and occasionally pigmented. To the touch they are soft and evidently atrophic. The abdomen, flanks, buttocks, and upper parts of the thighs and the breasts are most often affected. The striæ cannot be altered by any form of treatment

Idiopathic Atrophies of the Skin

Three conditions require consideration. Strictly speaking, none of them is an idiopathic or primary atrophy as each is the sequel of an inflammatory process of unknown origin. The inflammatory process may escape notice, but it is usually evident in the histology of the lesions To describe the remarkable laxity of the skin, the term "anetodermia" is used in certain varieties, and writers often use the descriptive terms



Fig. 238. Idiopathic atrophy in a woman aged 23.

"erythematosa" and "erythromelie" to emphasise the inflammatory nature of these conditions.

Diffuse idiopathic atrophy Atrophia cutis idiopathica progressiva. The cause is unknown. The patients are usually about forty years of age when the affection begins. Females are more frequently affected than males. The course is essentially chronic.

Pathology The process is an inflammatory one. The epidermis is thin, and the papillæ are flattened. In the true skin the elastic fibres and the collagenous tissue are atrophied. There is an increase in the number of capillaries, and the vessels are dilated. An infiltration of mononuclear cells is found in the connective tissue about the vessels. The glands and hair follicles are atrophic and there is no subcutaneous fat.

Clinical features. The atrophy usually begins on both ankles and spreads slowly the whole length of the lower limbs, ending at the groins

cicatricial atrophies are characterised by absence of pigment in others there is irregular or excessive pigmentation. The hairs sebaceous glands, and sweat glands are destroyed to a greater or less extent In some instances especially in some forms of epidermolysis bullosa, pemphigus, and rarely herpes there are solid epidermal cysts in the cicatrices.

The pathology of the primary atrophies is considered below

Congenital atrophy Developmental anomalies characterised by atrophy of the skin are rare They may be localised or widely spread. The pilo-sebaceous elements and the subcutaneous fat are absent.

Striæ atrophicæ

Striæ atrophicæ are linear streaks of atrophy of the skin caused by stretching and occasionally by other conditions. Some appear to be nævoid.



Fig 337 Striæ atrophicæ in obesity

Striæ atrophicæ are most commonly the result of pregnancy where they occur on the abdomen and upper parts of the thighs and buttocks and on the breasts. Obesity and occasionally swelling of the joints may cause them, but it must be noted that the striæ do not follow every kind of distension of the skin. They are not seen over tumours or in ascites nor after extensive hæmorrhages or dislocations, nor on herniæ. Moreover they occasionally appear after enteric fever influenzal pneumonia and other conditions attended with pyrexia and in cachexia due to malignant disease. Apparently there must be some predisposition on the part of the patient Though exceedingly common in women who have borne children one occasionally meets with a patient who has had a large family in whom they do not develop. It would appear that the pituitary gland has a potent influence upon striæ formation for the lesions are part of Cushing's syndrome which depends upon basophilic adenomata of the anterior pituitary

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yellowish or reddish tint, and the natural elasticity is lost. If the skin is pinched up it takes some time to return to its normal condition. The thinning of their covering exposes the outlines of the veins and the tendons. Parts exposed to the air are most severely affected. In some cases the surface is excessively dry and may suggest ichthyosis. Pigment spots are common and also telangiectases and small naevoid formation. Keratomata are not uncommon, and these may develop into epitheliomata (*vide* p. 672). In another type of senile atrophy the skin is not wasted, but thickened and wrinkled, soft to the touch and in coarse reticulated creases. Exposed parts, particularly the neck and the temples, are most affected and present a curious pattern of deep lines aptly described as "cutis rhomboidalis nuchae."

Histologically the essential features are the degeneration of the elastic tissue in the common type, and in the rarer form a colloid change. The epidermis is thin and pigmented. The glandular elements are atrophic while the vessels are dilated.

The senile skin is often the seat of pruritus, but it is curious that scratching affects it very little.

Several conditions closely simulate senile atrophy. Xeroderma pigmentosa, already described in the group of congenital affections of the skin, may be looked upon as a precocious senility of the skin in its tendency to pigmentation, atrophy, wart formation, and epithelioma. In certain occupations in which patients are exposed to the vicissitudes of the weather, *e.g.* seamen, coachmen, agricultural labourers and the like, the exposed parts of the skin become very much like those observed in xeroderma and senile degeneration. This affection differs from xeroderma pigmentosa only in its late development. Unna described an analogous condition in seamen, followed by multiple epitheliomata. He called the cancerous stage "Seemann's Haut Carcinom."

Atrophic Conditions affecting the Vulva

Owing to a lack of co-operation between dermatologists and gynaecologists the literature reveals considerable confusion and it is doubtful whether some of the conditions described by the gynaecologists are, in fact, specific clinical entities. As a tribute to the pioneer work of Berkeley and Bonney, the conditions termed leukoplakic vulvitis and kraurosis vulvae are described according to these workers, but they should be regarded in relationship to the following conditions which are established in dermatology. A number of pathological processes account for atrophy and chronic inflammatory changes of the vulva as they do for lesions in other parts of the body. In addition, it is known that atrophic changes are due to endocrine disturbances associated with the menopause, natural or artificial, and from a dermatological aspect it would not appear necessary to look for some more abstruse factor in the etiology of leukoplakic vulvitis or kraurosis vulvae.

Leukoplakia. The term leukoplakia is often loosely applied to any white lesion of the mucous membrane, but Schwimmer (1877) described two types, the first showing greyish or silvery white streaks and patches and a smooth, shiny surface which occur in mucous membrane lesions,

and buttocks In some cases the upper extremities are also involved, the process starting on the backs of the fingers or hands and extending to the shoulder The flexures and the palms and soles usually escape At the onset the affected areas are red or bluish and there may be some slight scaling of the surface By the coalescence of the extending circumscribed lesions diffuse areas are produced. In the later stages the skin is red or bluish or brownish in colour atrophic and inelastic, and wrinkled and transparent The underlying veins and tendons are usually distinct

The disease is distinguished from scleroderma by the redness and the absence of the stage of induration

Treatment. Beyond the application of emollients to make the parts more supple nothing can be done.

Macular idiopathic atrophy Anetodermia erythematosa of Jadassohn. In this variety there is an eruption of atrophic spots upon the trunk or limbs Usually they are rounded or irregular and do not exceed a shilling in size. At the onset they resemble urticarial wheals or syphilitic macules. At first they are a light red colour but in the atrophic stage they assume a pearly white tint the thinned areas feeling like holes in the skin. The patients are usually young females (Fig 338)

Histologically the lesions are of the same type as those mentioned above but in addition there are masses of fat in the cutis, due to fatty changes in the connective tissue.

The lesions have to be distinguished from cicatrices left by the various diseases and injuries already described in this chapter

Atrophy of the fatty layer of the skin. (Relapsing febrile nodular non-suppurative panniculitis (Christian).) Under this title Christian and Weber have described a painful nodular eruption consequent upon an idiopathic inflammatory lesion of the adipose tissue associated with recurrent fever and resulting in various degrees of atrophy It has to be differentiated from macular atrophy morphoea and in the early stages from indurated nodal erythemas.

Acrodermatitis chronica atrophicans. This name is given to a localised atrophy preceded by inflammatory infiltration occurring chiefly on the limbs. Both sexes are equally affected, and the disease most commonly appears about the fortieth year

In the early stage the lesions resemble erythema nodosum, but they are rather ill-defined. The red or purplish colour is followed by a yellow tint The later stage which usually comes under observation is a crinkly paper shining atrophy with little scaly patches Keratoses and a fish-scale appearance through which the veins stand out clearly as in senile degeneration (*infra*) The elbows, the inner aspects of the forearms and the backs of the hands are the areas affected in the upper limb. On the lower the dorsal surfaces of the feet and the knees are the common sites. Occasionally there is severe pain but often there are no subjective symptoms

Senile Degeneration

Senile atrophy of the skin (the Biotripsis of Cheatle) is characterised by a parchment like thinning of the integument. The surface has a

characterised by hyperæmia and cellular activity followed by epithelial hypertrophy and sclerosis of the sub-epithelial tissue.

Pathology Berkeley and Bonney describe a swelling of the epithelium and desquamation, with vascularity of the sub-epithelial tissue and lymphocytic infiltration. At a later stage plasma and connective tissue cells accumulate and lymph nodes form. In the final stage the epithelium becomes hypertrophied, the elastic fibres in the connective tissue disappear and sclerosis is complete.

The cause of the affection is unknown. No evidence of syphilis can be obtained.

Clinical features Four stages are described. In the first the parts are red, swollen, and look excoriated. In the second the labia minora decrease in size and the area involved is of an opaque white colour at first in patches, but ultimately diffuse. In the third stage there are cracks and ulcers, which may become carcinomatous. In the fourth stage the whole of the vulval orifice is white, smooth and shiny the labia minora and the clitoris being completely atrophied from contraction. The affection *may* spread beyond the vulva on to the inner sides of the thighs and into the perineum. The meatus urinarius and the vestibule escape the leukoplakic process. There is intense itching in the first two stages. In the third the fissures and cracks are painful, and in the last stage all symptoms disappear

The disease has long been confounded with kraurosis vulvæ but according to Berkeley and Bonney they are distinct affections.

After reviewing the evidence, Hunt, 1943 considers that leukoplakic vulvitis is a variety of chronic lichen planus and that kraurosis vulvæ is the final atrophic phase

The *treatment* advised is the application of the X rays in small doses of 50 r to allay the irritation in the early stages, but no irradiation should be given in the hyperplastic stage when excision is the safest procedure. Simple lotions such as :—

Phenol. liq., ♏v
Glycerin, ℞xv
Liq hydrarg. perchlor., ad ℥i.

are more useful in the relief of pruritus than ointments. Sedatives should be given to prevent scratching

REFERENCES—BERKELEY and BONNEY *Proc. Royal Society of Medicine.* Obstet. Section, 1909 p. 22. Microphotographs of sections. The relationships to carcinoma are fully discussed.

Kraurosis vulvæ (Gk. *krauros* white dry). An atrophic condition of the vulva, with stenosis of the orifice probably of endocrine origin (p. 107).

REFERENCES—BONNEY *Proc. Royal Society of Medicine* 1928, p. 1067 E. HUNT Diseases of the Vulva." 1943.

Poikiloderma is the term applied to a mottled or reticular pigmentation of the skin often associated with telangiectasia and macular atrophy Civatte described such an affection involving the sides of the face of women usually about the menopause and spreading over the forehead, cheek and jaw towards the centre of the face and on to the sides of the neck (pp 105 and 274).

of lichen planus and lupus erythematosus The second type consists of whitish, thickened, and rough horny patches which represent hyperplasia of the epithelium and this type is regarded as precancerous. Its association with senile keratoses has been observed. Hyperplasia is often provoked by local irritation and chronic infections, and therefore it is not surprising that it should affect the vulva in cases of chronic pruritus or chronic vulvitis, and most probably it is this condition which Berkeley and Bonney described as leukoplakic vulvitis becoming carcinomatous.

Lichen planus (p 177) may affect the vulva as part of an extensive eruption or may be localised there. In the former instance diagnosis is rendered easy by the presence of the usual papules on the skin, but on the vulva the lesions consist of opaque white greyish, or silvery flecks, streaks, or patches and occasional small, flat topped, ivory-coloured papules may be seen. Patients are often unaware of the existence of these lesions.

Lichen sclerosus (p 181) may be a variant of lichen planus but some authorities regard it as a separate entity The characteristic eruption of the skin consists of irregular polygonal flat topped white papules or macules, discrete or grouped. The smooth, shiny surface of each papule is speckled with minute dark horny plugs or with the dilated follicular orifices left by such plugs

The lesions of lichen sclerosus on the vulva consist of papules arranged in linear or circinate patterns and sometimes aggregated into larger nodules, especially on the external surfaces of the labia majora in the genito-crural flexures, on the perineum or about the anus. Hyperkeratotic bands or streaks may be seen on the internal surfaces of the vulva, extending from the mons veneris to the anus and sometimes invading the vagina. The course is usually very chronic, and eventually atrophic changes cause shrinking of the labia minora and the folds of the clitoris. When the orifice of the vagina or anus is involved considerable contraction is the result and in the late stages lichen sclerosus gives a condition indistinguishable from kraurosis Indeed, kraurosis vulvæ as described by Breisky (1885) is merely an atrophic condition of the pudenda with shrinking and there is little doubt that the clinical picture may be produced by atrophic diseases such as lichen planus or lichen sclerosus as well as by senile changes. It is questionable whether it is practical to retain this term for the atrophy and shrinkage which is due to ovarian deficiency but for therapeutic reasons we have done so

Morphœa. Morphœa, or localised sclerodermia (p 106) may produce lesions very similar to the atrophic patches of lichen sclerosus, but usually the smooth, waxlike plaques can be recognised. The condition is to be distinguished from *vitiligo* or leukodermia (p 190) which produces white areas of skin but the absence of atrophy indicates the diagnosis.

Pruritus vulvæ Finally it must be realised that, as a sequel to chronic pruritus the lichenised and excoriated skin frequently infected settles down eventually to an atrophic condition with shrinking and thus may be confused with kraurosis While X ray therapy is of considerable value in the treatment of the early stages of pruritus, the radiation should not be given when the precancerous type of leukoplakia has developed In this rare event excision is alone justified as the safest procedure

Leukoplakic vulvitis. A chronic inflammatory condition of the vulva

CHAPTER XXIX

HYPERPLASIA AND TUMOURS

Keratoses—Cysts—Epithelioma—Rodent Ulcer—Malignant Melanoma—Fibroma—Sarcoma, etc.

THE tumours of the skin, like those of other organs, may be benign or malignant. They may arise :—in the epithelial elements, including the invaginations which form the hair follicles, sebaceous and sweat glands; from the connective tissue of the true skin; from the smooth muscle of the arrectores pilorum; from the blood and lymphatic vessels, and from the nerves.

Cutaneous tumours may be :—

(1) Congenital, or (2) due to senile changes in the skin. They may also be produced by :—

(3) Local irritation, such as friction, heat, actinic rays, X-rays, chemicals—tar and its derivatives, arsenic, etc.

(4) Infection—warts, molluscum contagiosum.

(5) Chronic inflammatory processes, *e.g.*, lupus, syphilis, etc.

(6) Disordered metabolism, cholesterolæmia—xanthoma.

(7) Retention of secretion—cysts.

(8) Extension or metastases from visceral and other neoplasms.

(9) Unknown causes.

Tumours of Epiblastic Origin

To many of the innocent tumours of epithelial origin the term "papilloma" is applied. Strictly speaking the name should only be given to conditions in which there is hypertrophy of the papillæ, but by common usage it is given to warty lesions of inflammatory and neoplastic origin.

The callosity and corn are hypertrophies of the horny layer of the epidermis, the result of local irritation (p. 297).

Warts (Verrucæ). The common wart, verruca vulgaris, verruca plana juvenilis, verruca filiformis, verruca digitata and verruca acuminata are considered in Chapter XXVI, as there is no doubt of their infectivity. There is evidence that the greasy yellow so-called "seborrhœic wart" which is common in considerable numbers on the back and chest of elderly subjects is likewise locally contagious, and this form is included with the affections due to viruses (p. 637).

Keratosis senilis. Senile Keratoma (Gk. *keras*, horn).

Keratosis is seen most commonly on the face of elderly subjects. The condition is of great importance, as the lesions may develop into multiple epitheliomata.

The disease manifests itself first by the appearance of dry yellow or brownish spots, or by warty elevations and sometimes as red telangiectatic spots with an irregular outline. The lesion becomes covered with a grey or brown, or blackish layer with a rough surface. This layer is very adherent, and sends conical processes into the skin, and its removal is

A similar dermatosis, commonly affecting the trunk and limbs was described by Jacobi The tendency to atrophy is more marked so that an appearance resembling X ray atrophy may ultimately arise (p 278)

Ainhum (from African word meaning to saw)

An endemic disease in certain tropical countries characterised by spontaneous amputation of the little toe It was first recognised on the West Coast of Africa, but is now known to be widely spread, occurring in Brazil, the West Indies some of the Southern States of America, India, and the islands in the Indian and Pacific Oceans. Sézary showed a Senegalese whose ainhum developed six years after he left Africa



FIG 330 Ainhum (Photograph of specimen in the Wellcome Bureau of Medical Science Copyright)

The disease affects young adults, and is commoner in males than in females Heredity has also been recorded. It only attacks the dark races, but the cause is quite unknown There is no association with leprosy

The disease manifests itself by a furrow forming around the junction of the little toe with the foot There is no inflammation but the gradual constriction of the base leads to swelling and œdema of the toe. The toe is spontaneously amputated by a process of necrosis and ulceration at its base. The ulcerative stages are attended with great pain. Fig 330 shows a toe amputated *below* the constriction. X ray examination showed no change in the bones The disease runs an essentially chronic course often lasting several years In rare cases other toes are attacked. Incision of the constricting band in the early stages is curative Where the disease is advanced amputation of the toe is necessary

The warty lesions produced by tar and its derivatives, by arsenic and in chronic radio-dermatitis and the seborrhoic wart may closely simulate senile keratoma and should be borne in mind

Treatment. The lesions may be removed by operation, or by the X-rays, or by radium. The carbon dioxide pencil also gives good results. In the early stages, resorcin and salicylic acid in the form of an ointment or paint are often sufficient Trichloracetic acid applied on a glass rod after cleansing the surface of the wart with ether or benzene is also satisfactory It is advisable to limit the action of the acid by applying vaseline around the lesion, and to resort to excision or irradiation if a caustic is not soon effective

Actinic keratoses. Keratoses solares are hyperplastic lesions corresponding morphologically to the senile keratoses, but as they usually arise on the pigmented areas which characterise the chronically sunburnt skin it is reasonable to suppose that the hyperplasia is secondary to prolonged irritation with ultra violet light. Norman Paul holds this view and recognises as a predisposing phase a condition described as dermatitis solaris chronica in which the pigmented and slightly scaly rough spots are similar to those seen after over-exposure to X rays and also in tar and pitch workers. The weather-beaten skins of sailors and boatmen and of farm labourers may show a similar condition, and no doubt chronic irritation of any kind will accelerate these degenerative changes which accompany old age Some predisposition to these degenerative and hyperplastic changes undoubtedly exists, and in the case of keratosis solaris the outstanding example is xeroderma pigmentosa (p 73). Long residence in the tropics is a common cause of solar keratoses.

Arsenical keratoses. The affinity of the skin and its appendages for arsenic appears to account for the pigmentation and keratoses which are occasional delayed sequelæ of prolonged internal administration. These warty keratoses are most common on the palms and soles but may affect the dorsal surfaces. Small indolent ulcers may occur and epitheliomatous change sometimes follows or in other cases multiple squamous-celled warty growths arise on different parts of the body

Chondrodermatitis nodularis chronica helicis. This condition is known as " painful nodular growth of the ear " (Foerster). The lesions are small, firm, warty excrescences, rounded or oval in shape, about ½ cm. or less in diameter as a rule and they are usually found on the edge of the auricle at its highest point. The nodules may be skin-coloured or greyish, and wart like or rather pale. The essential feature is the exquisite tenderness which is often so great that the patient is unable to bear contact even with a pillow on the affected side. Thus, when bilateral, the discomfort seriously interferes with sleep.

Etiology A specific cause is not known, but it would appear that exposure to the weather and perhaps friction produces some degeneration in the skin and cartilage which becomes the site of a chronic inflammatory process in which minute areas of necrotic cartilage act as foreign bodies and maintain a granulomatous reaction. The histology confirms this view

Diagnosis The lesion is to be distinguished from the keratoses and from epitheliomata, none of which are painful as a rule. The only satis-

usually attended with slight hæmorrhage Sometimes the central part of the spot shows some atrophic change.

The change to epithelioma may be unsuspected but sometimes there is a rapid increase in the growth and ulceration and infiltration of the dermis and hypodermic tissue follow The malignant lesion is almost invariably a squamous-celled carcinoma.

The patients are usually over sixty years of age, and the tumours form on the forehead, the temples, and other parts of the face, and sometimes on the backs of the hands parts exposed to irritation Spontaneous cure may occur rarely when the hyperkeratosis falls off leaving an atrophic spot, but as age advances more and more lesions appear

Pathology The epidermis is very irregular so that the thickened horny layer appears to make geographical indentations into it Nucleated

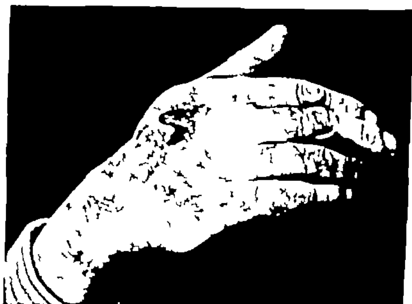


FIG. 340 Cutaneous horn on senile keratosis.

cells are to be found in the stratum corneum. The stratum mucosum is thinned. Vacuolation of the basal cells may be marked and simulate Paget's disease (intra-epidermal carcinoma) The vessels of the distorted papillæ are dilated and surrounded by patchy infiltration with round cells Degenerative changes are present in the elastic tissue

These changes are common to the precancerous dermatoses, *i.e.*, the actinic and arsenic keratoses tar warts Bowen's disease and various types of leucoplakia. In all a local hyperplasia of the epidermis may initiate a malignant change and later undifferentiated epidermal cells invade the dermis in narrow strands Cell-nests are often absent and their absence gives the growth a similarity to the basal-celled epithelioma.

Diagnosis. The senile keratoma has to be distinguished from the pigmented mole, which is congenital, from the lesions of syphilis, acne rosacea, and lupus erythematosus. The special distribution of the lesions and the age of the patient should suffice

and consequently have a red colour This condition is congenital and may be considered as a symmetrical form of nævus. It has already been described on p. 61

(2) Asymmetrical lesions of the same character occur in elderly subjects as pink, sometimes lobulated, tumours on the scalp, back and face. They vary in size from a small pea to a nut. They are of little clinical importance and the nature may not be recognised until sections are cut. Related to these are the pale tumours of Balzer-Menetier type which contain altered hair follicles and sebaceous glands.

(3) Small sebaceous gland tumours sometimes occur on the inner aspect of the lips and cheeks. They form minute usually multiple creamy white raised spots. The condition, which occurs after puberty is called *Fordyce's disease*

Tricho-epithelioma. A rare affection characterised by small papules in the skin about the eyes (Fig 341), in the naso-labial grooves, and on the scalp, and less frequently on the chin and neck.

The tumours are the same colour as the skin or a little paler

They vary in size from a pin's head to a lentil seed. They are most frequently seen in women of adult age, rarely in men There may be a history of their development in the patient's family

Histologically they consist of sharply defined lobulated down-growths of epithelial cells, which are dilated at some places into cysts Lanugo hairs are found in them, and they are believed to be derived from the hair follicles. The patients are usually girls or young women.

Epithelioma adenoides cysticum of Brooke. In this type the lesions are larger and more scattered over the face than in the preceding form. The tumours appear in childhood, and there is usually a history of heredity The condition is considered in the chapter on congenital affections of the skin (p. 61)

Hidradenoma, Syringocystadenoma, Syringoma. (Gk. *hydros* sweat; *syrinx* tube). Tumours of the sweat glands occur :—

(1) As single papillary or flat tumours, which may or may not have been noticed in childhood. In some of these tumours there are degenerate changes in the connective tissue of mucoid or hyaline character

(2) An eruptive form, Hidradénomes éruptifs, characterised by the eruption of a large number of small tumours, varying in size from a pin's head to a split pea. This affection is believed to be of congenital origin and is described on p 63

(3) Tumours of the sweat glands may be associated with vascular nævi.

(4) Small tumours of sweat gland origin are occasionally seen on the labia majora. They are to be distinguished from cysts of the glands of Bartholin

Many of these small tumours cannot be identified by their clinical appearances and a biopsy is necessary to establish the diagnosis.

Treatment. Benign tumours of the appendages of the skin may be excised or if small, treated by electrolysis or the cautery X-ray treatment is recommended by Savatard in Brooke's epithelioma adenoides cysticum.

factory treatment is excision or the destruction of the nodule by some form of cautery Local applications are quite ineffective.

Tumours of the Appendages of the Skin

New growths may develop from the sebaceous glands, from the hair follicles, and from the sweat glands

The tumours of the *sebaceous glands* are (1) those characterised by typical or approximately typical hyperplasia of the sebaceous glands, including the *symmetrical sebaceous adenoma of Pringle* (2) *epithelioma* of the sebaceous glands.

Tricho-epithelioma and epithelioma adenoides cysticum of Brooke are tumours arising from the *hair follicles*

The tumours of the *sweat glands* are (1) hyperplasias (2) simple or complex cystic tumours (3) hidradénomes éruptifs of Jacquet and



Fig 341 Tricho-epithelioma. Female, æt. 24

Darier also called syringomata (4) adenomata of the sweat glands of the labia (5) epithelioma

Fox Fordyce disease comprises small tumours arising from the compound sweat sebaceous glands termed the apocrine glands of Schiefferdecker Some regard the eruptive hidradenomata of Jacquet and Darier as tumours of these glands but that view seems improbable (see p. 106).

Growths of the sebaceous and sweat glands and from the hair follicles may be present in the same individual and in the same tumour The malignant forms will be considered in the section on cutaneous cancer

Sebaceous adenomata occur —

(1) As a symmetrical affection of the face The tumours are numerous and occupy the naso-labial sulci the root of the nose and the forehead. They begin in childhood, increase in number and persist throughout life. The most characteristic type is that described by Pringle where the lesions contain both vascular and glandular elements,

and consequently have a red colour This condition is congenital and may be considered as a symmetrical form of naevus. It has already been described on p. 61

(2) Asymmetrical lesions of the same character occur in elderly subjects as pink, sometimes lobulated, tumours *on the scalp, back and face.* They vary in size from a small pea to a nut. They are of little clinical importance and the nature may not be recognised until sections are cut Related to these are the pale tumours of Balzer Menetier type which contain altered hair follicles and sebaceous glands.

(3) Small sebaceous gland tumours sometimes occur on the inner aspect of the lips and cheeks. They form minute, usually multiple creamy white raised spots. The condition, which occurs after puberty is called *Fordyce's disease*

Tricho-epithelioma. A rare affection characterised by small papules in the skin about the eyes (Fig 341) in the naso-labial grooves, and on the scalp, and less frequently on the chin and neck.

The tumours are the same colour as the skin or a little paler

They vary in size from a pin's head to a lentil seed. They are most frequently seen in women of adult age, rarely in men. There may be a history of their development in the patient's family

Histologically they consist of sharply defined lobulated down-growths of epithelial cells, which are dilated at some places into cysts. Lanugo hairs are found in them, and they are believed to be derived from the hair follicles The patients are usually girls or young women.

Epithelioma adenoides cysticum of Brooke. In this type the lesions are larger and more scattered over the face than in the preceding form. The tumours appear in childhood, and there is usually a history of heredity The condition is considered in the chapter on congenital affections of the skin (p. 64).

Hidradenoma. Syringocystadenoma. Syringoma. (Gk. *hydros* sweat *syrinx* tube) Tumours of the sweat glands occur :—

(1) As single papillary or flat tumours, which may or may not have been noticed in childhood. In some of these tumours there are degenerate changes in the connective tissue of mucoid or hyaline character

(2) An *eruptive form, Hidradénomes éruptifs*, characterised by the eruption of a large number of small tumours, varying in size from a pin's head to a split pea. This affection is believed to be of congenital origin and is described on p. 68

(3) Tumours of the sweat glands may be associated with vascular naevi.

(4) Small tumours of sweat gland origin are occasionally seen on the labia majora. They are to be distinguished from cysts of the glands of Bartholin

Many of these small tumours cannot be identified by their clinical appearances and a biopsy is necessary to establish the diagnosis.

Treatment. Benign tumours of the appendages of the skin may be excised or if small, treated by electrolysis or the cautery X ray treatment is recommended by Savatard in Brooke's *epithelioma adenoides cysticum.*

Cysts (Gk. *kustis* bladder)

Cysts occur in the skin in the following varieties :—

(1) **Sebaceous cysts** varying in size from a millet seed to an egg occurring in the true skin or subcutaneous tissue. They are of soft consistence, and fluctuation may be observed. The skin over them is normal, or perhaps a little thinned. There is no alteration of the colour unless the lesions become infected with pus organisms The contents are opaque and of a pasty consistence, and sometimes oily Various names are given, according to the character of the contents—steatomata cholesteatoma, etc. The material contained in the cysts consists of epithelial cells and the products of their degeneration—fat, fatty acids, cholesterine, saponaceous bodies and sometimes calcareous particles



Fig 342. Milia of pinna of right ear Patient æt. 33 Noticed 3 years.

These are the common sebaceous cysts, usually called wens an indiscriminate but popular term with the laity They are dilated pilo-sebaceous organs They are umbilicated, and their contents can be removed through the orifice by expression. Multiple sebaceous and epidermal cysts which occur on the scalp and scrotum, usually in adults and in old age are often deeper than the sebaceous cyst and have no orifices.

The frequent familial incidence of sebaceous cysts appears to indicate that they are nævoid in origin and are not true retention cysts. Sedgwick, 1863 reported on two families in which sebaceous tumours of the scalp were inherited, in the one for at least ten and in the other for five generations, the defect being completely limited to the females. (Quoted from Cockayne)

We have reported cases of familial sebo-cystomatosis which, in our opinion are not uncommon.

Reference—J T Ingram and M. C. Oldfield. *B.M.J* 1937 1, 960

(2) **Dermoid cysts** are enclosures of embryonic elements, and occur therefore, about the orbits, especially at the outer canthus, in the middle line of the nose, in the neck, and in the median line of the perineum and scrotum *i.e* in the embryonic lines of fusion They contain hairs and hair follicles, sebaceous glands etc

(3) **Milium** is the name given to the minute pinhead sized tumours seen on the upper two-thirds of the face in adults. The lesions are of a pearly white colour and do not increase in size. They are cyst-like bodies with a wall of flat epithelial cells and contain horny cells in concentric

layers. They lie in the epidermis and are not connected with the sebaceous glands. Unna believes them to be derived from lanugo-hair follicles and thus may be regarded as tricho-epithelioma the illustration of which, Fig 341 serves equally well for milium. The similar lesions occurring on the external genitals in adults are true retention sebaceous cysts. Milium in infants is also a retention cyst of the sebaceous glands.

(4) Cicatricial epidermic cysts are small, flat, circular white or greyish-white lesions, the size of a pin's head to a millet seed, occurring in the site of bullous eruptions. They are most common in one form of epidermolysis bullosa (Fig 11), but also occur in pemphigus, dermatitis herpetiformis, and in herpes zoster (Howard Warner). They may also follow injury when fragments of the epidermis are imbedded in the corium. Similar lesions are not uncommon in the margins of scars produced by radium or X-rays. Small epidermal cysts may also arise in the mid line or in the lines of fusion and represent minor developmental defects.

(5) **Kystes graisseux sudoripares.** Under this name a very rare condition characterised by multiple cysts of the sweat glands has been described by Dubreuilh and Auché. The tumours are very numerous globular white cysts about the size of a pea, containing an oily material. In the cases described they were widely distributed, but were most numerous in the axillæ. Dr Graham Little in 1915 showed a female patient, æt. 66, who had hundreds of itching cystic tumours of small size (the largest was ¼ inch in diameter) in the axillæ, flexor aspects of the limbs, chest and abdomen. The skin was dry and in certain areas pigmented. Microscopically the lesions were cysts containing a mass of stratified epithelium continuous with the epidermis and closely resembling the cicatricial epidermal cyst.

Treatment of cystic tumours. If of large size, and the patient desires their removal, they should be excised. Wens may be injected with a few drops of ether at intervals, and when the resulting elimination of the tumour occurs, the cyst wall should be removed with forceps or a small curette. Milium is best treated by the curette or by electrolysis. The simplest treatment is to prick open the overlying integument and then to express the pearly cyst with dissecting forceps.

X-rays in doses of 200 r., repeated at intervals of two weeks for three treatments, have often caused milia to disappear.

Hidrocystoma is a rare condition characterised by minute firm elevations of the skin with a pearly translucent appearance due to clear serous fluid. They vary in size from one to six millimetres, and occur in females particularly on the face. The lesions tend to disappear in the winter and reappear in spring. It is believed that heat is an etiological factor.

The vesicles are formed by a dilatation of the ducts of the sweat glands (*vide* p. 727).

Molluscum Contagiosum. Small sessile, rarely pedunculated pearly white tumours, usually multiple, affecting the face, eyelids, genitals, and other parts.

This affection is caused by a filterable virus and is undoubtedly contagious. It is considered with warts and other virus diseases on p. 628

Cutaneous Cancer

Cancer of the skin may be primary or secondary The primary carcinomata are malignant neoplasms developing from the epidermis and from the glandular and pilar organs derived therefrom The secondary cancers invade the skin by extension from neighbouring mucous membranes, or from subcutaneous organs such as the mammary glands, and by *metastasis from cancers of the viscera In the metastatic neoplasms the* character of the tumour is essentially that of the primary growth, and the same holds good for the cancers *invading the skin from the adjacent organs.* Some primary carcinomata are squamous-celled tumours but those derived from the basal layer of the epidermis and from the glandular elements of the skin have special characters The malignancy of skin cancers varies greatly some have a high degree of malignancy and some are relatively benign. Again, some forms tend to early involvement of the neighbouring lymphatic glands and to metastatic development while others are remarkable for their purely local malignancy

It is of the highest importance for the medical practitioner to recognise the early stages of malignant tumours of the skin for early radical treatment is more often attended with success in cutaneous malignant disease than in cancer of any other organ.

Etiology of cutaneous cancer We are ignorant of the cause of skin cancer *as of other forms of malignant disease The special features which* stand out in a review are the age at which it appears and the influence of *local irritation and of certain precancerous conditions*

Age Cutaneous cancer is very rare before forty When it occurs in younger subjects there is usually a predisposing cause *e g* xeroderma pigmentosa, lupus or over treatment by X rays

Heredity apparently plays some part in this as in other cancers.

Sex Males are more commonly affected than females presumably because they are more exposed to external irritants

Local irritation The frequency with which the face is affected suggests that *exposure i.e* irritation by wind and weather and by the rays of the sun plays an important part Unna recognised a special variety of cancer which he called seaman's skin cancer Norman Paul points out the frequency of cutaneous carcinoma in Australia and lays stress on the irritative effects of actinic light. Fig 141 illustrates a rapidly developing cancer following repeated solar dermatitis in an albino negress. Sequeira showed that in lupus cancer males whose avocations necessitate exposure are more frequently affected than females Frequently recurring traumatism may also start a malignant process. Sequeira had under his care a man of twenty-eight with a rodent ulcer on the lower part of the face on an area which had been repeatedly struck by the recoil of a rifle

The *Kangri burn cancer of the lower abdomen and thighs*, which is so common in Kashmir is caused by the repeated application of an earthenware bowl heated by wood charcoal. Neve believes that the primary cause of the Kangri cancer is heat, but that volatile substances from the

combustion of wood play a secondary part. O'Donovan has reported a case in which repeated burns in a baker produced carcinoma.

X-rays. Frequent exposure of the skin to the X-rays, which was so common in the early days of radiography and the treatment of chronic diseases of the skin such as lupus, has caused many cutaneous cancers of the squamous type. The skin shows atrophic changes which have been already described (p. 815), but the cancer may not develop on it for several years after the exposure to the rays has ended.

Tar and its derivatives, creosote and anthracene, produce a precancerous state on which warts develop into papillomatous tumours, "tar molluscum." Many of these tumours drop off but in men who have been long engaged in the work characteristic cancer develops. It will be remembered that the application of tar to the skin of mice causes cancer

Paraffin. Men engaged in extracting paraffin from shale suffer in a similar manner

Soot. The chimney sweep's cancer is produced by the local irritation of the soot on the scrotum.

Mule-Spinner's Cancer was caused by repeated irritation with a carcinogenic fraction present in the heavy mineral oils (see p 334)

Tobacco is another irritant which especially in association with leukoplakia tends to cause cancer of the tongue and lower lip, but no doubt heat and friction of a rough pipe stem are more potent than nicotine.

Arsenic. The prolonged administration of arsenic leads to hyperkeratosis, particularly of the palms, and this, as Hutchinson pointed out, may become epitheliomatous. Hamilton published a case in which the patient had taken the drug for thirty-five years. The makers of arsenical sheep-dip are also liable to cancer

Other conditions predisposing to skin cancer are *senile keratosis* a peculiar degeneration with a tendency to the development of warty growths, especially on the face. Multiple epitheliomata occur in this condition.

Xeroderma pigmentosa, which may be looked upon as a precocious senility of the skin, is the cause of epithelioma in the young; children six or seven years old developing characteristic epitheliomata, often multiple, on the affected skin of the face and hands (Plate 4)

Lupus vulgaris, lupus erythematosus syphilitic and other scars may be the seat of epithelioma (Fig 254)

Chronic ulcers especially varicose ulcers, may become carcinomatous and watch should be kept for the everted hypertrophic edge which often marks the malignant phase. Carcinoma arising in such ulcers or on scars are sometimes called Marjolin s ulcers.

Sebaceous cysts or *wens* may also undergo malignant change or may simulate it by a granulomatous reaction in the base of an nfected cyst, Cock s peculiar tumour is of this nature.

Bowen has called attention to a precancerous dermatosis occurring in late adult life characterised by chronic papular lesions covered with a horny crust. These spread to form nodular swellings which may become grouped or confluent. Under the crust is a red, oozing, slightly papillomatous surface. Cancerous degeneration has been observed by Bowen and Darier It is believed by Darier that an important feature in the

histological picture of Bowen's precancerous dermatosis is dyskeratosis with the development of intracellular vacuolation closely resembling that seen in the "molluscum bodies" of molluscum contagiosum

REFERENCE.—C. NORMAN LAUT "Cutaneous Neoplasms." (Lewis, 1933).

PRIMARY CANCERS OF THE SKIN

The primary cancers of the skin differ in their histological characters. We have, on the one hand, the squamous or spino-cellular carcinoma—the so-called "epithelioma." On the other hand, there is the equally characteristic baso-cellular tumour of which "rodent ulcer" is the type.

Between these two quite distinct forms there are mixed or intermediate cases in which the histologist may find it difficult to decide which is the predominating element. Sometimes lesions which are clinically typical of rodent ulcers are found histologically to be of squamous-celled type or the basal-celled processes contain a few cell nests, and considering the close relationship between these cells it is surprising that metaplasia is not more common.

The clinical course of these types and their reaction to treatment varies. None of the skin cancers except those about the lips are commonly followed by metastases but, while in squamous carcinoma involvement of the nearest lymphatic glands is common, it is unknown in rodent ulcer. In the squamous variety and in the basal-celled type treatment by radium and X rays usually gives excellent results, but in either type radio-resistant cases may occur. Intermediate types as differentiated histologically stand midway as regards malignancy and their tendency to form metastases.

Squamous-celled Carcinoma "Epithelioma"

The lesions start in the epidermis and are characterised by the formation of cell nests. Two distinct groups demand recognition. The first is primarily superficial and relatively benign while the second is of deeper origin and highly malignant. The former may be regarded as intra-epidermal carcinoma, to which variety also belong Bowen's disease, Paget's disease, psoriasiform epithelioma and erythroplasia of Queyrat in its late phase. It is important to recognise that the superficial forms may under certain circumstances infiltrate deeply and they then assume the more malignant character of the second group.

Pathology. The tumour is composed of squamous epithelium with cell nests. Large down growths penetrate the true skin. These down growths are composed of large polygonal cells which retain their prickle character in the upper part but become rounded in the deeper portion. The cell nests or "pearls" consist of concentric layers of horny cells. Occasionally mucoid degeneration produces minute cystic cavities. The stroma is very little developed but plasma cells are found in large numbers at the margin of the growth. There is no tendency to encapsulation, and infiltrations along the lymphatic vessels are often present.

(1) Superficial type. This form is sometimes called papillary epithelioma. It occurs in three varieties.



Fig. 843. Squamous carcinoma, showing numerous cell nests.



Fig. 844. Squamous-celled carcinoma. Female, æt. 70. The axillary glands were involved.

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(1) Superficial type. This form is sometimes called papillary epithelioma. It occurs in three varieties

condition is described later (p. 681) as a type of multiple superficial basal celled epithelioma, but is mentioned here because of its ultimate tendency to give rise to metastases. The histology cannot be predicted from the clinical features.

(c) *The malignant horn*. This rare form of tumour may begin on apparently normal skin or on a senile keratoma (Fig 340). The essential feature is an enormous development of horny cells. The lesion may be of large size, and in appearance sometimes closely resembles the ram's horn. The base is red and infiltrated. The face and scalp are the commonest sites, but the glans penis may be affected.

(2) Deep type. This form is sometimes called cancroid. It is highly



Fig. 346. Epithelioma, beginning at muco-cutaneous junction. Glands already involved (*vide* Fig 347).

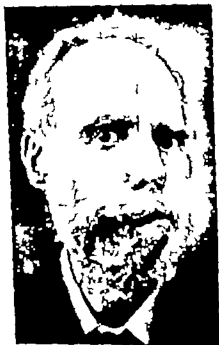


Fig. 347. Epithelioma. The same patient four months later. A rapidly fatal type.

malignant and penetrates deeply and involves the glands early. It especially favours the muco-cutaneous junction (Figs. 346, 347) and cavities but also occurs in the scars of injuries, burns, syphilitic ulcers, and on lupus vulgaris, lupus erythematosus and in xeroderma pigmentosa. On the mucous surfaces it is frequently secondary to syphilitic and other forms of leukoplakia.

Developing upon normal skin, the primary lesion is a small nodule which is of a greyish colour and often covered with a small scale. Irritation by scratching and friction causes the nodule to increase in size and to extend deeply. The surface becomes red and inflamed, and ulcerates. Rapidly increasing in size, the nodule forms a tumour which projects above

(a) A warty excrescence which may develop upon normal skin or upon a senile keratoma It may also occur in chronic irritation from tar and its derivatives It occurs most frequently upon the face or about the lips or neck, and occasionally on the back, and on the dorsal aspect of the hand (Fig 342) For a long time it may have the appearance of a wart and beyond a little bleeding which occurs when the top is removed by the towel or in washing it may cause the patient no uneasiness Sooner or later the warty excrescence begins to increase in size and *forms a disc like tumour* with a superficial scab about the centre. The lesion bleeds easily and may



Fig 315 Discoid or button like epithelioma. Male æt. 62. Tumour of two years duration.

ulcerate. Finally the infiltration may extend deeply and become highly malignant. *The glands are usually involved late*

(b) Nodular or flat lesions of a similar type are met with on the lips and on the mucous membrane of the mouth, and also on the glans penis and the vulva *One type is termed erythroplasia of Queyrat* The surface is red shiny smooth or like velvet After a comparatively long and slow course the lesion may become ulcerated and infiltrate deeply

Psoriasiform epitheliomata most often occur as solitary or multiple lesions on the trunk As the name suggests, the lesions are erythematous and scaly and the dry type of Paget s disease is very similar The former

the skin and has an infiltrated base The lesion is hard, and the edge becomes raised to form an everted rim while the central parts are eroded, forming an irregular ulcer covered with a greyish exudate which bleeds easily The tumour may be painful and the glands are involved early

Similar appearances occur when the tumour develops upon a scar (Fig 348) or upon lupus (Fig 234) (See Plate 58)

Age Squamous-celled cancer usually occurs late in life but in xeroderma pigmentosa it may develop in early childhood, in lupus vulgaris and lupus erythematosus in adolescence and early adult life Very occasionally epithelioma occurs independently of these conditions in child-



Fig 348 Squamous carcinoma (Epithelioma) starting in a scar Eighteen months duration. Recurrence after removal Rapidly fatal.

hood, *e g* Battle and Maybury described a primary epithelioma of the nipple in a girl of eleven and lip cancer has been seen in a boy of fourteen

O Donovan has shown two cases in young girls in which the lesions were multiple and of a very superficial type affecting the face

Course The tumour rapidly increases in depth and *sloughing* perhaps of large masses of tissue takes place The glandular growths also increase in size, and finally may fungate upon the surface Involvement of the deep vessels may cause death by *haemorrhage*, but more commonly the patient dies slowly by exhaustion It is uncommon to find metastases in the viscera

Treatment of squamous-celled epitheliomata In our experience the

majority of the small squamous-celled epitheliomata of the skin react favourably to the method of irradiation described for the basal-celled lesions, and in the absence of other facilities the small squamous-celled epitheliomata may be treated with radium plates. However rapidly growing lesions are likely to give metastases in the glands, and these carcinomata should be referred early to a surgeon or to a special radio-therapeutic clinic for malignant disease. The melanomata respond badly to irradiation and the earlier these lesions, or any epithelioma arising from a pigmented mole of any type are seen by a surgeon, the better

Baso-cellular and Glandular Tumours. Rodent Ulcer

We now have to consider the neoplasms which arise from the deep or basal layer of the epidermis and from the pilo-sebaceous glands. To many

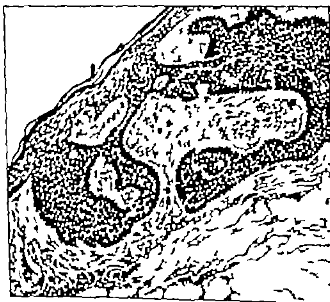


Fig. 340 Rodent ulcer Basal-celled carcinoma.

of these conditions continental writers apply the term "epithelioma," but in this country from the clinical course the name rodent ulcer is more commonly used.

Baso-cellular tumours are the most common cancers of the skin except in black races. They are very rare in the African.

Histologically the tumours consist of ramifying, often pointed processes which invade the dermis and subcutaneous tissue, or of lobules, composed of cells which have either the character of the basal cells of the epidermis, or of the cells lining the pilo-sebaceous ducts (Fig 340). Cells of true sebaceous gland type do not occur Some observers believe that the tumours may start in the sweat glands, but this must be exceedingly rare

PLATE 58



SQUAMOUS-CELLED CARCINOMA (EPITHELIOMA).

An epithelioma behind the left ear; rapid involvement of gland. (Patient of Mr. Hunter Tod.)

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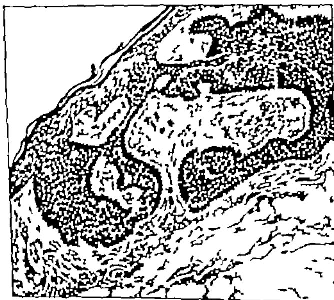


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Sometimes the connection with the basal layer of the epidermis can be made out in sections and in other cases the continuity with the pilosebaceous organs is demonstrable The amount of stroma varies, but is usually relatively large in amount. It may be fibrous in the chronic types and embryonic in the more malignant forms

Clinical appearances. The disease usually starts in middle or advanced life, though Sequeira had a case in which the lesions dated from the twelfth year and others in which the patients were thirteen and seventeen at the onset Senile keratosis is a rare antecedent The seat of election is the face above a line drawn through just below the lobule of the ears and crossing the face below the nose. The inner and outer canthus,

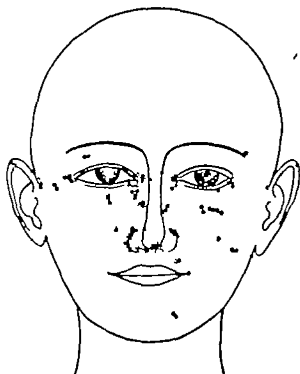


Fig 350 Site of origin in 200 cases of rodent ulcer

the side of the nose particularly the alæ, and about the ears are the commonest sites (Fig 350) Rarely the lesions may occur on the lip Basal-celled carcinomata of the trunk are rare We have seen them on the shoulder under the scapulæ in the mammary region, and on the back and limbs Gray showed a case in which a rodent ulcer started on a patch of psoriasis in the gluteal cleft

The primary lesion is usually a firm nodule of a greyish or pearly tint the size of a pin s head or a lentil, resembling a flat wart or molluscum contagiosum, or an adenoma of the sebaceous or sweat glands The patient may complain of slight itching and this frequently causes the nodule to be picked, or scratched, perhaps with a little hæmorrhage Not infrequently the lesion passes unnoticed until the top is cut off in shaving or rubbed off with the towel The nodule very slowly increases in size and sooner or later the central part ulcerates, and a small scab forms. In

the course of several years it may gradually spread peripherally and occasionally takes on rapid growth. There is very rarely any large tumour though exceptionally there may be deep infiltration with cystic formation There may be a tendency to spontaneous cicatrisation in the centre while the periphery presents a ridge of spreading nodules. A pigmented rodent ulcer may be mistaken for a malignant melanoma

(a) **Superficial cicatrising type.** This variety is seen most commonly on the temple and scalp, but also sometimes on the eyelids, nose etc The characteristic appearance is an irregular sclerotic scar surrounded by a rim of small greyish elevations with a smooth surface often pearly and crossed

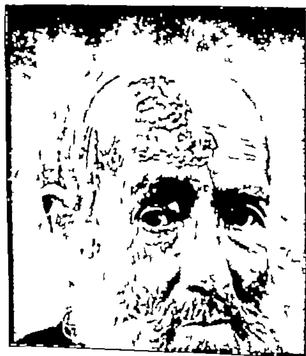


Fig. 831 Rodent ulcer of fifteen years' duration. Male, æt. 75. Superficial type. Parts spontaneously cicatrised.

here and there by fine papillary vessels. This beaded margin is highly characteristic. The condition is essentially chronic, and may gradually spread for many years. Sometimes it takes on a more active course, and by deep ulceration involves the cartilages, the bones and muscles. The glands are seldom affected. Recurrence after apparent cure is common.

Morphœic or "card-like" type In this form of rodent ulcer the lesion has an ivory-like or waxen surface on which dilated capillaries are visible. It closely resembles morphœa or localised sclerodermia, and the flat infiltration with a smooth surface has been likened to a card let into the skin. This variety may remain quiescent for a long period, but usually ends in ulceration.

Sometimes the connection with the basal layer of the epidermis can be made out in sections and in other cases the continuity with the pilo-sebaceous organs is demonstrable The amount of stroma varies, but is usually relatively large in amount It may be fibrous in the chronic types and embryonic in the more malignant forms.

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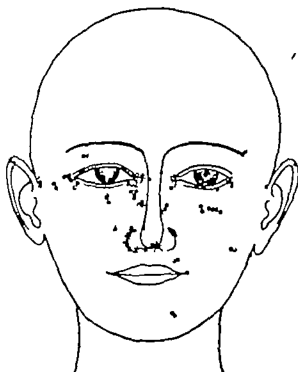


Fig 350 Site of origin in 400 cases of rodent ulcer

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Rodent Ulcer

Of [illegible] years duration. The smooth pink rim of the ulcer crossed by fine vessels is well shown. The ulcer healed under radium, but relapse occurred and the process has spread deeply.



Turban Tumour (Cylindroma)

A rapidly growing fungating tumour on the scalp. It diminished rapidly under treatment by X-rays and was finally excised. There was no recurrence. The patient died some months later from cerebral haemorrhage.

(*b*) **Non-cicatrising type** The initial growth and slow evolution resemble those of the cicatrising variety but the lesion remains a chronic

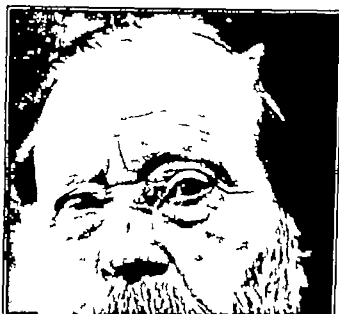


FIG 652. Rodent ulcer of seven years duration, affecting inner canthus. A common type which may invade the orbit



FIG. 653 Rodent ulcer Duration sixteen years. Excavation of orbit No operation.

indolent slowly spreading ulcer It spreads superficially and also deeply producing in the course of years grave deformity especially when attacking the nose or the orbit (Plate 50)

(c) **Terebrant variety** As a rul this form succeeds one of the varieties just described, but it may be highly malignant *ab initio* The new formation and ulceration progress very rapidly in depth rather than on the surface, and produce huge excavations, with puriform or foul sanious discharge (Fig 853). The cavities are surrounded by induration which is moderately well defined. This form is very destructive and of great local malignancy It is remarkable that the glands are scarcely ever affected, and very often the general health is unimpaired. Death is usually the



FIG. 854 Multiple tumours, of rodent type, apparently following senile keratomata. This patient lost the left eye, but all the tumours disappeared under the X-rays.

result of opening up of a deep vessel or of some complication or septic infection.

Multiple rodent ulcers. Occasionally rodent ulcers are multiple (Figs. 854 855). Two or three characteristic tumours are not uncommon. We have seen familial instances of this type. In some of the cases there has been the condition known as "tropical skin." In the case illustrated in Fig 855 the lesions were all small. Adamson has suggested a relationship between this type and the multiple benign epitheliomata.

Multiple superficial rodent ulcers. "*Erythematoid Benign Epithelioma*" (Little). In 1910 Foedyce pointed out that many cases of multiple epithelioma of the skin closely resemble in their early stages Paget's disease. He described them as having sharply defined margins with little



MULTIPLE SUPERFICIAL BASAL-CELL CARCINOMATA

Female aet. 57. There were other lesions on the face and limbs.

between the epithelial cells proper. Some authors class the lesions as endothelioma, others as varieties of sarcoma. They form extensive turban-like tumours on the scalp, rarely on the face; ulceration is rare, and the course is relatively benign (Plate 60).

Diagnosis of malignant growths of the skin. At the onset these affections have to be distinguished from warts and moles. In an elderly subject a growing mole or wart should always excite suspicion, and if there is the least doubt a biopsy should be made, or if the tumour is small it should be excised. The Hunterian chancre should not give rise to difficulty, but if necessary a scraping should be made and examined for the treponema. Tertiary syphilitic ulcerations may sometimes simulate a malignant ulceration. Here the Wassermann reaction would be useful, or the effects of mercury and iodide of potassium may be tried for a couple of weeks. A biopsy would of course be of value. The superficial cicatrising type of rodent ulcer may cause trouble, as it may simulate lupus vulgaris or lupus erythematosus. The presence of the beaded edge with capillaries running over its smooth surface is a help in diagnosis, but, where there is doubt, a piece of the edge should be removed for microscopical examination.

Prognosis. The prognosis in cases of carcinoma with glandular involvement is necessarily grave, but in the superficial forms of rodent ulcer and the less malignant types of epithelioma, local measures, particularly radiotherapy and radium, may cure. It is, however, impossible to promise that there will be no recurrence. Pigmentary naevo-carcinomata are of grave import unless treated radically at the earliest possible moment.

Treatment of rodent ulcer. The most obvious treatment of the small rodent ulcer is excision. As wide a margin of healthy skin as possible



Fig. 356. Rodent ulcer of sixteen years duration, in a patient aged [illegible].



Fig. 357. The same patient cured by X-rays and free from recurrence for six years.

tendency to form the characteristic edge of the rodent ulcer The surface is red and scaling but may develop fungating growths The lesions are multiple, the commonest sites are the trunk, but the limbs and face may also be affected. The patients are elderly and in several there has been a history of psoriasis or seborrhoeic dermatitis. The appearance of the common type of lesion is illustrated in Plate 61 Sometimes a narrow raised, pearly border is present The surface is usually pinkish or reddish brown and it may be scaling suggesting psoriasis On some lesions there are raised, vascular fungating tumours Spontaneous cicatrisation may

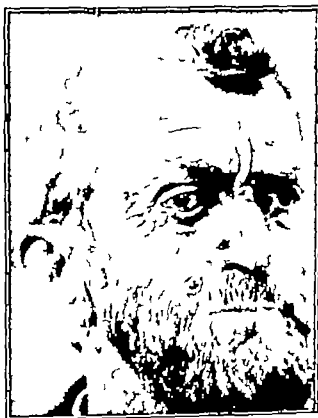


FIG 335 Multiple small pearly tumours on the face tending to central ulceration Microscopically they resembled rodent ulcer The patient was 50 years of age and had suffered for many years. The X rays rapidly removed the growths.

occur in parts In the case figured here there were both basal-celled and squamous-celled tumours The condition is essentially chronic and often causes little disturbance to the patient The condition may be mistaken for psoriasis and for lupus erythematosus, but the persistence of the lesions in certain areas and the preference for the trunk, should simplify the diagnosis.

REFERENCE—M. JOHNSON *Brit Journ. Derm & Syph* 1915 27 58.

The cylindroma is a rare variety of tumour occurring especially on the scalp It is generally considered to be a peculiar variety of baso-cellular carcinoma. A number of explanations have been given of the peculiar cylindrical appearance of the cellular growths in the sections The stroma forms curious transparent cylinders and oval masses which are found in

centimetre of surface and faced with Monel metal 0 1 millimetre thick is the applicator of choice. This is usually covered with thin dental rubber and is applied to the superficial rodent ulcer and 3 or 4 millimetres of skin surrounding it the normal skin being protected by lead sheeting ½ millimetre thick. An initial treatment of three hours is given and the patient is seen again in six weeks time, when a second treatment of the same duration is applied if the slightest evidence of persistence of the epithelioma is detectable. Reaction to the radium application begins in about a week or ten days and erythema a slight exudation or crusting develops



FIG. 859 The same patient after treatment by radium.

for two to three weeks and then the inflammatory reaction subsides, so that in a favourable case the skin surface may be smooth and apparently normal in six weeks time Two or three treatments may be necessary but if the response is not then quite satisfactory the lesion should be treated by X-rays or gamma ray therapy or be destroyed by diathermy (p. 764)

Although a rodent ulcer is often amenable to irradiation, exceptional cases have been met with where no response has been obtained with any form of irradiation, and it is well to recognise these cases before involvement of bone or cartilage makes the prognosis hopeless. We have treated a large number of cases with radon seeds, and gamma irradiation is undoubtedly a satisfactory method of treatment, but in our opinion not more so than beta irradiation in the case of superficial lesions.

should be left round the growth and the full depth of tissue should be removed, because the danger is one of local recurrence only Secondaries in the glands do not arise We have seen many relapses following excision, and it should be remembered that, when surgery alone was used, rodent ulcers got a bad name for the frequency of relapses so that the tag "noli me tangere" was applied, and attention was given to alternative methods such as the destruction of the growth by cautery and the use of X rays and radium At first hot irons were devised for burning out the growth, but diathermy offers a much better method. Considerable success followed



Fig 358 Crateriform rodent ulcer

the use of radium, and although future developments will tend to restrict the use of radium and X rays to radiotherapeutic clinics specialising in the treatment of malignant disease we believe that the use of a radium plate is simple, safe and provides a most satisfactory method of treatment for small superficial rodent ulcers. No therapeutic agent or device is so constant in its activity as a well sealed radium applicator and in spite of a modern tendency to use exclusively the gamma rays, beta rays being more readily absorbed by the tissues provide a more rapid and powerful treatment Moreover when an applicator is applied to the skin over a lesion not exceeding ½ cm in depth no correction for distance has to be made A full strength radium plate containing 5 milligrammes of radium per square

telangiectaticum has been given by Parkes Weber to a similar spread in which dilated capillaries and lymphatics accompany the erysipelatous blush.

(iii) Direct spread of the growth through the tissues with the formation of fungating lesions in the skin.

The lesions are hard, pink, or brownish tumours varying in size from a pin's head to a pea, or even a small nut. They may be isolated, or by coalescence form indurated irregular areas. The name "cancer en cuirasse" is given to tracts of infiltration thus formed by the aggregation of nodules, but is more often the result of lymphatic infection and subsequent solid œdema. The cancerous nodules may undergo atrophic changes, but more commonly they break down and form ulcers or fungate.

Pathologically the cells of these metastatic growths are similar to those



FIG. 800 Columnar-celled carcinoma of skin. Secondary deposit.

of the primary tumour e.g., if the primary growth is a columnar-celled carcinoma, the cells in the secondary deposit will be columnar (Fig 800). The lesions appear to be produced by emboli of cancerous cells from the primary tumour They are found in tracts along the vessels or lymphatic channels, or arranged in alveolar masses. They have no direct connection with the epidermis or the glandular elements of the skin.

Paget's Disease. Malignant Papillitis

Paget's disease is a chronic malignant affection of the nipple and areola occurring in women, usually over *forty* years of age, characterised by infiltration, with an eczematous or psoriasiform surface, associated with duct cancer in the mamma. In rare cases the same affection occurs in other parts, e.g., the perineum, penis, vulva, axilla, pubic and umbilical regions. Sequeira has seen mammary Paget's disease once in the male.

X ray therapy is also much used in some clinics and preliminary curettage is of great value but details of gamma ray and X ray techniques will not be given because much special knowledge and experience is required and no doubt the ideal is to have a radiotherapeutic team consisting of a surgeon a dermatologist a radiotherapist and a physicist with adequate facilities (For principles of radiotherapy see p 761 *et seq*)

The most troublesome cases are those in which the orbit is involved. The disease usually starts about the inner canthus and spreads to the bony margins of the orbit and, as a rule, necessitates the complete clearance of the cavity Another type of case which leads to grave destruction begins at the angle of the nose, and rapidly involves the cartilage and eventually the bone. Here operative procedures may be combined with X ray or radium treatment. We have several times seen a deep recurrence after apparent cure by radium and X rays, in the malar and maxillary region The growth rapidly invades the bone and may open the antrum and other accessory cavities of the nose. Malignant lesions of the pinna are also troublesome for the cartilage is often involved or necroses after irradiation. Very painful indolent reactions may ensue and perforations of the cartilage are not uncommon It should be borne in mind that the X ray or radium ulcer is usually extremely sensitive and painful whereas the untreated *malignant lesion is not*

Palliative measures Where the ulceration or growth is very extensive and the measures mentioned above are inapplicable we are obliged to resort to opiates for the relief of pain. The constant cleansing of the ulcerations with antiseptic lotions such as peroxide of hydrogen (5 to 10 volumes) boric acid (saturated solution) and the like is necessary to keep the parts from becoming foul It has been reported that some rodent ulcers have disappeared when constantly treated with bicarbonate of soda, *e.g.*, 40 per cent in pasta zinci Solutions and compresses may therefore be of value in palliative treatment

Secondary Carcinoma

Secondary carcinoma of the skin occurs in connection with mammary cancer and in visceral cancer They can be divided into two groups —

(1) Those disseminated lesions often occurring about the scalp or face from some internal visceral carcinoma *e g* prostatic

(2) The cases, more particularly mammary which result from direct spread from an underlying cancer

The first type is almost impossible to diagnose unless a histological examination be made of all cutaneous tumours. They sometimes simulate sarcoid but very often appear as simple skin carcinomata. The second type or mammary group demands the consideration of three forms

(i) A Paget type starting in the duct epithelium and spreading both into the breast tissue and the skin forming the intra-epidermal carcinoma around the nipple

(ii) *Carcinoma erysipelatodes* (Rasch) in which the spread is along both lymphatics and capillaries producing an appearance closely resembling the eruption of erysipelas. The name carcinoma

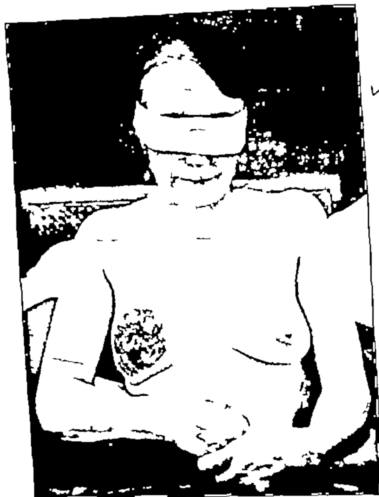


FIG. 602. Paget disease, of six years duration. Patient, aged 61. The lesion cleared up under X rays, but the mamma was involved early. Death eighteen months after.

the nipple usually occurs in women who are suckling and commonly both breasts are simultaneously affected. The eczematous skin is soft and only thickened with œdema.

The diagnosis is made certain by biopsy.

Prognosis. Unless treated radically Paget's disease tends to a fatal termination from dissemination of the malignant neoplasm.

Treatment. It is important to recognise that the process is malignant from the beginning, and the breast should be removed, together with the affected skin and glands should any be involved.

Malignant Melanoma (Gk. *melas* black)

The malignant melanoma may originate in a congenital anomaly, *i.e.*, a pigmented nævus or mole. To such the name "nævo-carcinoma" has

Etiology and pathology The cause of Paget s disease is unknown. It is a variety of intra-epidermal cancer probably arising in the milk-ducts and the malignant cells either infiltrate the epidermis or provoke a spreading metaplasia which is manifested by collections of large, rounded, vacuolated and poly nucleated cells called Paget cells in the rete. The *dermis is thickened* by solid lymphatic œdema Secondary fibrosis leads to retraction of the nipple. Pathologically the stratum corneum is very slightly affected, and the granular layer is present. The prickle layer is thickened, and the interpapillary processes are lengthened. The deeper parts of this layer show Paget cells ' containing bright, oval nucleated bodies, of which some are enveloped in a distinct capsule. The upper part of the corium shows dilatation of the vessels, and a dense infiltration consisting

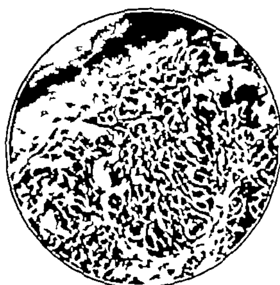


Fig 881 Paget s disease

of plasma cells Proliferating epithelial cells are also found in small foci in this layer

Symptoms *At the onset there is a small red area around the nipple* covered with a scab or with a small quantity of sticky yellowish exudation When fully developed, it forms a bright red erosion with a finely granular glazed surface sharply limited, and sometimes distinctly raised above the surrounding tissue. The induration may be palpable and when taken between the finger and thumb the lesion feels like a penny felt through a cloth There is no tendency to spontaneous healing and *the area affected* slowly increases until a patch the size of the palm of the hand may be involved. The nipple may be retracted, but the lymphatic glands are not enlarged. The patient may complain of itching and burning

Ultimately after two or three or rarely as many as twenty years the breast becomes infiltrated from the duct cancer the glands are involved, and death occurs from secondary deposits in the viscera or *from cachexia*.

The character of Paget s disease in other regions is similar

Diagnosis The red granular glazed surface seen on the removal of the crusts and the induration with well-defined margins together with the chronicity of the disease distinguish it from chronic eczema Eczema of

Fibroma durum. In contrast to the soft fibromata described above small shotty hard lesions, usually solitary occur on the legs and sometimes on the arms. They are felt in and attached to the skin which is normal in colour but somewhat thinned above them

Symmetrical ear nodules, which are apparently fibromata, occur in the natives of tropical countries. The lesions are symmetrical nodules deeply placed in the lobules of the ears.

"Knuckle-pads" are fibrous nodules in the cutis and subcutis over extensor surface of proximal and occasionally distal interphalangeal joints of one or more fingers or toes. There is some thickening of the skin over them and they give rise to little disability or discomfort. They appear at any age, in either sex and do not disappear and are liable to recur if excised.

There appears to be some relationship between this and Dupuytren's contraction of the palmar fascia with which it may be associated.

The nodules show some hyaline degeneration on histological examination.

Recklinghausen's disease has already been mentioned in connection with congenital tumours. The lesions are either *multiple* small tumours covered by normal skin (Fig. 31), or pendulous growths, sometimes of large size The two conditions may co-exist. The tumours vary in number from one or two up to several hundreds or more. Pigmented patches occur in connection with this variety of fibroma, and the skin is usually coarse There are also neuromata. Sloughing and ulceration may take place from pressure or friction. The pendulous tumours may attain large dimensions they occur at the occiput, neck and face and also on the trunk and upper segments of the limbs.

Odd varieties of fibroma pendulum may occur Crocker described a remarkable case in which, after an accident attended with paraplegia, the buttocks and legs began to enlarge. Enormous pendulous *folds of skin* and subcutaneous tissue, "overlapping like flounces," hung from the lower part of the chest halfway down the thighs and down the leg below the knee.

A not uncommon variety of fibroma usually very hard and the size of a pea occurs on the lower part of the legs, the thighs and forearms. The lesions are usually solitary and are attached to the skin.

The cause of all these conditions is unknown, but heredity plays some part Congenital cases are not infrequent, and it is believed that in most there is some anomaly of development.

Von Recklinghausen showed that in some cases the tumours develop in connection with the lamellæ of the nerve sheaths. The connective tissue varies from tough fibrous tissue to masses of loose, imperfectly formed fibres and gelatinous tissue. Unna described mast-cells as occurring in large numbers.

Diagnosis. Fibromata have to be distinguished from moles, but these are usually pigmented. Sebaceous cysts contain pasty white sebaceous matter which can be expressed. The rare cases of cysticercus of the skin may easily be mistaken for fibromata. Puncture and the finding of booklets in the fluid would be the only certain method of diagnosis short of removal.

Prognosis. Fibromata give little trouble except from their position They tend to increase in number and size.

In the African the tumours run a chronic course and are rarely seen until they cause difficulty in walking (Fig 303 depicts an advanced case). As a rule the malignant melanoma in the African is less liable to form metastases than in the European Brumbridge in Kenya had an interesting case in which a leg amputated for a large fungating foot tumour showed a black core running up the limb along the posterior tibial vessels

Treatment of malignant melanoma As soon as a pigmented nodule appears or growth is observed in a pigmented mole the lesion should be widely excised and sent for expert histological examination If the melanoma is well localised within the margins of excised tissue the patient may be kept under observation particular attention being paid to any return of pigment in the scar or to palpable nodules arising in the course of the lymphatics and to enlargement of the lymph glands. When doubt exists as to the complete removal of the primary growth or when a recurrence occurs, an extensive resection of the lymphatics with a strip of overlying skin and the remote glands probably offers the best chance of survival but even this radical procedure is often too late *It is probable that complete destruction of the early lesion with thermal cautery or diathermy would be satisfactory* but any form of irradiation freezing or painting with caustics is ill advised for one of the most lethal of all malignant diseases. Fungating tumours may require amputation of a limb



FIG 303 Melanoma beginning on a mole. Fatal issue after wide local excision.

A number of melanomata of the foot seen in dark races can be excised successfully even when the growth extends deeply *e g* between the bands of the plantar fascia. The prognosis depends upon whether there are metastases

Tumours of Mesoblastic Origin

Fibromata and neuro-fibromata. Several conditions are included under the term fibroma

Fibroma simplex. This name is applied to the common soft vascular pedunculated tumours which occur on the face neck and shoulders of elderly people. The lesions are rarely larger than a pea, and sometimes disappear leaving hernia like sacs

Fibroma durum. In contrast to the soft fibromata described above small shotty hard lesions, usually solitary occur on the legs and sometimes on the arms. They are felt in and attached to the skin which is normal in colour but somewhat thinned above them.

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Prognosis. Fibromata give little trouble except from their position They tend to increase in number and size.

Treatment Excision may be practised if the position or size of the growths require it. No form of radiotherapy influences the condition

Keloid Cheloid

(Gk chela claw)

Cheloid is a new growth of the corium occurring after injuries, and occasionally spontaneously

Etiology Cheloid occurs equally in both sexes and at all ages. It is commoner in certain races than in others and negroes appear to be specially liable to it and it is often seen in tribal marks to which irritants may be applied to render them more conspicuous (Fig 696) There is undoubted predisposition for some subjects develop cheloid after very slight irritation, such as the application of caustics blistering and contusions which would not even produce a cicatrix It may follow an operation after first intention healing and in one case seen by Sequeira one limb only of an L-shaped incision became cheloid. It is frequent after the excision of linear warty naevi and is often more prominent than the original lesion and may cause severe flexural contractures. We have seen it follow the bites of mosquitoes it is common after scrofuloderma and lupus vulgaris and may follow acne vulgaris, vaccination, hypodermic injections tattooing perforation of the lobules of the ear for earrings syphilitic ulcers herpes zoster etc Burns and scalds including burns from strong acids and alkalies however furnish the majority of cases, but slight irritants such as phenol and painting with iodine may cause cheloid in a susceptible subject Spontaneous cases are rare and in many of them it is difficult to exclude slight traumatism. A common site for spontaneous cheloids is over the sternum corresponding to the brooch clasp of a blouse



Fig 696 Multiple cheloids in a native of Kenya. (Photograph kindly lent by Dr F W Vint.)

Pathology Cheloids are composed of masses of connective tissue

bundles, running more or less parallel to the surface of the skin The fibrous tissue develops around the blood vessels, and the claw like prolongations of the tumours are formed along the vascular channels. The papillæ are absent in the greater part of the growth but not everywhere There is no essential difference in the histology of the scar and the spontaneous cheloid.

Clinical features. The lesions may be single or multiple. The tumour is a well-defined, raised, ovoid or rounded plaque, or of irregular shape. A characteristic feature, which is, however not constant, is the claw-like prolongations, which spread from the central mass into the surrounding skin The surface of a cheloid is smooth, often shining and sometimes nodular It may be white, or red, or purplish the colour



Fig 307 Cheloid, following a burn

depending upon the presence of dilated vessels upon it. Where the mucocutaneous junctions are affected, there may be grave deformity and when situated at flexures the movements of the parts are impaired. Cheloids are often tender and the patient may complain of pain, or of burning and itching Sometimes the pain is intense, but in other cases there are no subjective symptoms. Scar cheloid may occur anywhere, and when following a burn or scald may be of considerable extent, as in the case figured (Fig 307). It may spread beyond the actual scar area, but in the most extensive scars it is usual to find some areas of normal cicatrix, with the cheloid in patches. Sequeira had a remarkable case following a burn of the face from sulphuric acid. The whole of the scar area was covered by an irregular quilted mass, with characteristic claw like processes at the edges.

In the idiopathic form the lesion is usually single, and the trunk is

affected in one half the cases This variety occurs more frequently in women than in men. The cheloid is of moderate size, with a well-defined margin discoid ovoid, or irregular in shape, with claw like prolongations as in the scar variety Tenderness and pain are also common.

After reaching a certain size the cheloid remains stationary or spreads slowly or it may undergo spontaneous resolution Malignant change is rare. It is thought that the tendency to cheloid formation can be reduced by massage or compression with elastic strapping to prevent lymph stasis in the injured part Chronic ulceration is an occasional complication

Prognosis Spontaneous resolution of cheloids sometimes occurs and this is said to happen more frequently in young subjects Usually the course is slowly progressive and then stationary for a long period.

Treatment. Cheloids should not be excised unless X ray therapy is



Fig 308 The same case after treatment by X rays.

given before the wound has healed, preferably as soon as possible after the operation Doses of 200 r through 1 millimetre of aluminium may be given at weekly intervals for three doses In many cases irradiation alone produces a marked improvement in the ugly scar Since the doses necessary are in the danger limits for healthy skin the scar should be surrounded by lead. Doses of 400 r through 1 millimetre of aluminium or even more heavily screened, may be given and repeated at three week intervals for three doses If after six months appreciable improvement has not occurred radium may be tried with advantage In small lesions applications of the full strength radium plate for one and a half hours may be given, and repeated in six weeks for three doses

If gamma rays are used the dose should be half to three-quarters of that reserved for a malignant lesion. Some cheloids do not respond to irradiation, and since it is bad practice to continue large doses of radiotherapy for benign lesions, a cheloid should be either left alone after a trial therapy on the above lines or else, when necessary excision followed by irradiation should be used instead. It is obvious from the nature of the reaction that excision alone or any method of destruction of the scar by some form of cautery is only likely to produce a larger scar. Palliative procedures which occasionally give satisfactory results are the inunction of ung. iod. denigres. or ionisation. The cathode should be applied to the hard scar.

Lipoma

Lipomata are dealt with in the surgical text books. Sometimes they come under the observation of the dermatologist. They are usually multiple, subcutaneous tumours, varying in number and from a pea to an orange in size, soft and lobulated, and have a peculiar pseudo-fluctuation. Lipomata occur anywhere. Sequeira showed at the Royal Society of Medicine an infant in whom there were symmetrical congenital lipomata attached to the plantar fascia.

Fatty growths may occur in fibromata and angiomata and other tumours.

Lipomata should be treated surgically if necessary.

Dercum's disease is a painful lipomatosis. It may be a familial affection, but often arises in middle life. It appears to depend on some endocrine perhaps pituitary disturbance.

Colloid degeneration. Colloid milium. A rare affection occurring chiefly in men over forty five who have been exposed to weather though occasionally described in children. The lesions are papules of transparent yellow or reddish yellow colour on the nose, cheeks and upper lips and backs of hands. The mucous membranes, the conjunctiva, and lips may be involved. Pigmentation and atrophy of the exposed parts are common. Colloid degeneration of the connective tissue of the cutis is found on microscopical examination. The lesions may be removed by the curette or electrolysis.

Xanthoma tuberosum is a metabolic disorder (see p. 90).

Pseudo-xanthoma elasticum. Elastorrhexis. The tumours are of a yellowish tint arranged in groups or streaks and are usually not larger than a lentil. They occur on the abdomen, sides of the neck and in flexures. The growths cause no symptoms. Microscopically giant cells are found associated with degeneration of the elastic tissue of the true skin. The condition is probably a congenital anomaly (see p. 69).

Myxoma

Rarely tumours of myxomatous type occur on the genital organs and on the eyelids and about the finger ends and joints. More often myxomatous degeneration takes place in fibromata, etc. The treatment is excision.

Myoma or Leiomyoma

(Gk *leios* smooth *myx* muscles)

These remarkable tumours are composed of smooth muscle tissue, in the form of networks or bundles. They arise from the arrectores pilorum, or from the muscular walls of the cutaneous vessels Myomata of the skin are rare, and are more common in women than men

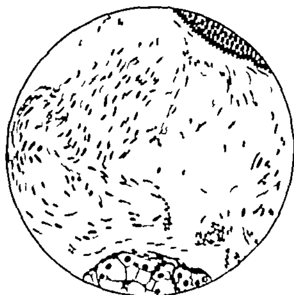


Fig 800 Leiomyoma Microscopic appearances (× 150)

They form firm pinkish or brown tumours varying in size from a pea to a nut. They may be disseminated or in groups. They are tender on pressure and the patient may complain of attacks of pain as the result of local irritation or of cold In a patient under Sequeira s care the tumours were remarkable for their unilateral distribution on the forehead and cheek They may closely resemble other small tumours and cysts of the skin and a biopsy is necessary to establish the diagnosis. Treatment is by excision or destruction of the nodules by some form of cautery

Solitary tumours may occur usually on the trunk spreading slowly over the course of years and attaining considerable size The lesions are reddish with a broad nodular margin over which course dilated vessels Excision may be followed by recurrence unless it goes very wide of the lesion

The glomus tumour which arises from the glomus body also contains unstriped muscle It is described on p 71

Calcareous Tumours

These are of four kinds (1) The most common are the small hard nodules the size of a small seed, occurring on the inner aspect of the tibiæ in old people. The condition is supposed to be due to calcification of fat lobules

(2) In the second type the lesions are inflammatory swellings dermoids or neoplasms which have undergone calcareous degeneration They may follow a cold abscess phlebitis etc

(3) Calcification of tumours of supposed sebaceous gland origin occur in women and children. Sometimes the lesions are multiple and appear chiefly on the extremities. Their origin from the sebaceous glands is doubtful. In some cases the lesions appeared to be primarily of inflammatory origin, the chalky deposit lying in the connective tissue.

(4) Subcutaneous calcareous granulomata (Calcinosis). The subjects of this condition are usually young. After an injury a painless swelling occurs, often in the site of a subcutaneous bursa, such as that over the olecranon. The swelling is at first soft, and if opened a creamy fluid containing chalky matter escapes. Fresh lesions form from time to time and the older ones become of stony hardness. Atrophy of muscles and immobility of the joints follow. The skin may be dry and pigmented in patches. Wasting and febrile symptoms, with albuminuria and hæmaturia and diarrhœa, may occur. The condition sometimes ends fatally.

The lesions resemble those of tuberculosis, but the central areas are filled by calcareous granules.

A microbic origin has been suggested. Treatment in the earlier lesions by operation is recommended (see Calcinosis cutis p. 102).

Hyperplasia of Vessels and Vascular Tumours

Vascular tumours occur as congenital abnormalities of the skin and cavernous hæmangiomata have been described (p. 53) and cavernous lymphangiomata (p. 57). The small painful nodule known as glomus tumour should also be noted (p. 71).

One type of pyogenic granuloma presents a small vascular bright red nodule which is sometimes mistaken for a hæmangioma (p. 463).

Kaposi's multiple idiopathic sarcoma usually presents many purplish and very vascular nodules or tumours, but the vascular hypertrophy is associated with masses of round cells and eventually this disease runs the course of a sarcoma. It is again referred to below with the page reference.

Some of the lesions produced by telangiectases may present small papules or nodules, such as angiokeratoma and the angiomata of the senile (de Morgan's spots). For this reason the varieties of telangiectases are now considered.

Telangiectases. (Gk. *tele* end *angeion* vessel) The word "telangiectasis" means a dilatation of the vessels farthest from the centre of the circulation, but, as generally used, the cutaneous nævi and angiomata are excluded.

Etiology Telangiectases may develop in early life and are then probably of congenital origin. For convenience, the form called nævus araneus, which is often acquired, has already been described with the vascular nævi (p 54)

Telangiectases are often associated with other cutaneous affections, usually of a congestive or inflammatory nature. The commonest causes are rosacea, adenoma sebaceum, lupus erythematosus, some forms of scleroderma, rodent ulcer and sarcoid. They are an essential feature of poikiloderma, Schamberg's disease Majocchi's purpura. A similar condi-

tion occurs in the X ray and radium cicatrices and from exposure to wind and sun. Circulatory disturbance is another frequent cause Telangiectases may occur in heart disease and in certain pulmonary affections and in young subjects with a bad peripheral circulation (*vide* angio-keratoma p 57) and in Graves disease. Osler called attention to the frequent *association of telangiectases and angiomata with* hepatic disease and Galloway described dilatations of the vessels in various abdominal diseases

Besides these symptomatic telangiectases, there are several types which are primary or idiopathic

Clinical features of the primary telangiectases (1) The dilatations of the capillaries may form *diffuse areas* of redness or *networks* distributed widely or of limited size They may follow vaginal hysterectomy erysipelas and chronic renal disease or syphilis.

(2) The telangiectases may form *plaques* The lesions may be macular dilatations of the vessels from a pin s head to a sixpence in size. Slight branny scaling may be present Obesity and the menopause and mammary carcinoma have been associated conditions. Rarely a segmental area is involved.

(3) *Angiomata of the senile* (Dubreuilh) *de Morgan spots* These occur on the trunk and upper parts of the limbs, in later middle life, and more commonly in men than in women. They are red points at first but enlarge to the size of a millet seed or even a pea The epidermis is unaffected They bear no relation to malignant disease. In rare cases angiomata of this type occur on the face and may attain a large size, and bleed freely if ruptured In one case angiomata were found post mortem on the mucous membrane of the respiratory tract, the rectum and urethra and in the liver

(4) *Familial telangiectasia* is characterised by recurring epistaxis and multiple telangiectases of the skin and mucous membranes (see p 54)

Treatment Attention should be directed to the primary cause as mentioned under etiology Certain drugs such as adalin may also produce these vessels, so that the possibility of such a cause should be determined by inquiry When required for cosmetic reasons, superficial telangiectases may be destroyed by fine galvanocautery or by inserting a needle connected to the negative pole of a galvanic battery and applying a current of 1 to 2 milliamps for twenty to thirty seconds. If the vessel wall is correctly pierced nascent hydrogen can be seen displacing the blood, and sometimes a good cosmetic result ensues In other cases the vessels seem to be unduly resistant, or re-develop after treatment, and in our experience it has not been possible to destroy numerous small vessels without leaving some ugly pittings. This applies especially to the large leashes of capillaries and minute venules which not uncommonly disfigure the inner aspect of the lower third of the thighs in young women.

SARCOMATA OF THE SKIN

Cutaneous sarcoma may be primary or secondary to tumours of the bones, viscera or glands Kaposi s multiple idiopathic sarcoma (so-called) is considered on p 142

Primary Sarcoma

The growths may be composed of large or small round cells, or of spindle-cells, or of lymphoid cells. In some cases there is a great deposit of pigment derived from the blood. The cause of cutaneous sarcomata is unknown

One variety of localised sarcoma is not very uncommon in infants and young subjects We saw an infant of three months of age who developed a slowly progressive indurated swelling on the left side of the nose A tumour developed in the cutis and the skin over it was of normal colour The growth was removed and found to be a localised spindle-celled sarcoma.

Generalised sarcomatosis. This rare affection may begin on any part of the body The tumours vary from a couple of dozen to several hundreds. At first they are small, not exceeding a pea in size, but they may reach the size of a cherry or form flat plaques which, as in the case reported by Jacob and Wallace, may be two inches across. The growths may start in the corium, or perhaps more commonly in the hypoderm. They are of a pale red or bluish red colour and in some cases the skin over them is covered with dilated capillaries. The clinical features and the rapidity with which the tumours are disseminated vary very much in different cases. The tumours may break down and ulcerate and occasionally one or more may disappear spontaneously A moderate degree of lymphocytosis may be present in the blood. Histologically the more malignant tumours have been found to consist of round cells, with numerous mitoses and very little stroma.

The affection may start in early life and the prognosis is usually hopeless, death occurring in from six to twelve months. However arsenic administered internally or by hypodermic injection has sometimes a remarkable influence Kobner and Shattuck and others have reported cures Coley's fluid might also be tried. X ray treatment will often cause a temporary diminution in the swellings.

Boeck's multiple benign sarcoid has already been discussed in connection with the cutaneous tuberculides (p 502).

Secondary sarcoma of the skin is rare. Sequeira had one case in which the primary disease was in the bones of the *tarsus* The secondary tumours were in the scalp.

GROUP 7

DISEASES OF THE APPENDAGES OF THE SKIN

CHAPTER XXX

AFFECTIONS OF THE SEBACEOUS GLANDS, HAIR FOLLICLES AND SWEAT GLANDS

Keratosis Pilaris—Lichen Spinulosus—Pityriasis Rubra Pilaris—Darier's Disease—Alopecia—Hirsuties—Hyperidrosis

The Pilo-Sebaceous System and the Hair

These appendages of the skin being highly specialised parts of the integument are subject to numerous alterations of function and structure. It may be of service to consider them as a group giving references to the particular sections of this work in which their etiology is considered

The anomalies manifest themselves by increase or diminution of the *secretory activity of the sebaceous glands* by *hyperkeratosis of the follicles* and by variations in the growth of the hair including complete absence or defluvium. The influences which affect the system may be classified as follows —

(*a*) **Congenital (developmental)** Some nævi show anomalies of the hair follicles and are characterised by linear or other birth marks which may or may not be attended with excessive hair growth. In a rare form the hair follicles are not formed (*vide* pp 58, 60). Specialised varieties are adenoma sebaceum (p 61) epithelioma adenoides cysticum (Brooke) (p 64) tricho-epithelioma (p 669)

A form of keratosis of the hair follicles, often associated with xeroderma is of congenital origin and is considered below (p. 700)

(*b*) **Nutritional.** The health of the pilo-sebaceous system is largely dependent upon an adequate supply of certain vitamins (*vide* p 80). The name " Phrynoderma " is given to the form associated with deficiency of vitamin A (p 77) It is essentially a hyperkeratosis of the follicles Hair growth is possibly influenced by various vitamin deficiencies On clinical grounds we include here the " seborrhoeides, " which in part, at least, depend upon an adequate supply of vitamin B (p 80).

(*c*) **Endocrines** The health of the pilo-sebaceous system is largely influenced by *the secretions of the endocrine glands.*

- (i) Thyroid Hyperthyroidism increases hair-growth but alopecia areata may occur Myxœdema and cretinism are characterised by dryness of the skin and defective development of hair
- (ii) Adrenals Hyperactivity produces hypertrichosis, particularly of the areas of secondary sexual hair-growth (p. 101). These organs may also play a part in the production of acanthosis nigricans (*vide infra*)
- (iii) Sex glands The relationship of hair growth to puberty is physiological. Castration of the pre pubertal male prevents the normal

development. The menopause and oophorectomy tend to a change from the female to the male type Hirsuties is common in women after the climacteric (p. 108).

Acne vulgaris is recognised as being in part at least associated with puberty (p. 108).

The remarkable affection known as Fox Fordyce disease affecting the axillary (and sometimes other) glands readily responds to endocrine treatment (p. 106).

(iv) The influence of the pituitary endocrines is described at p. 104

(*d*) Nervous influences. In rare cases areas of baldness exactly correspond to Head's areas. But in the great majority affections of the pilo-sebaceous system indicated by alopecia show no segmental distribution. Yet we are convinced that there is a nervous or psycho-somatic factor in many cases of localised as well as general fall of hair It is probable that the defluvium is brought about by an endocrine intermediary

(*e*) Fungous affections of the hair follicles have been discussed in Chapter XX, p. 412. We must, however here refer to the "ide" group of reactions which appear to affect specially the pilo-sebaceous system. We have (at p. 429) described and figured the follicular type of "ide" associated with fungous infections of the skin—the trichophytides, favides, leviurides, etc. There is also an important group of cases of follicular keratoses, described here, which so closely resemble the known "ides" that we feel they must have a similar origin.

(*f*) Bacterial infections. The pilo-sebaceous glands may be infected from without; viz., certain impetigos, sycosis, etc. (p 453). They also are affected from within in another "ide" group, of which the types are tuberculides (p. 495), syphilides (p. 536)

(*g*) General conditions affecting the system. Severe febrile illnesses may seriously influence the activity of the pilo-sebaceous organs. Fall of hair is often noteworthy in typhus, enteric and some influenza epidemics. Grave emaciation in famine conditions acts similarly We have noticed that some women lose an excessive quantity of hair in childbirth and we have seen it in successive confinements.

In all this group one may suspect a *toxic* factor

(*h*) Doubtful origin. There still remain a few cases of alopecia which cannot yet be traced to a particular source. Lichen plano-pilaris is considered at p. 180.

Asteatosis (Gk. *a*, without *stear* fat)

This is a condition characterised by diminution of the sebaceous secretion. It does not appear to occur idiopathically but is observed in ichthyosis, scleroderma, and in psoriasis and prurigo It is also met with on patches of nerve leprosy

The application of certain soaps, spirit, and soapless shampoos, which remove the normal fatty secretion may also cause it.

The skin is harsh, dry and frequently scaly the epidermis may become thickened and fissured.

The treatment is to replace the absence of natural oil by the inunction of fatty substances, ung aquosum, lanolin, etc.

Seborrhœa

This name is applied not only to a hypersecretion of sebum, but also to excessive oily secretion from the sweat glands.

(a) *Hypersecretion of sebum.* The characteristic features are the dilatation of the sebaceous gland orifices with an accumulation of fatty material in the form of plugs which can be expressed. This material is composed of epidermal cells of inspissated sebum, and of microbic parasites. The acne bacillus which is found in enormous numbers, is claimed by Sabouraud as the cause of the seborrhœa. It is the same parasite which occurs in the acne comedo As already indicated, the oily habitat favours the growth of certain micro-organisms, but it is difficult to believe that this excess of a normal secretion is more than a suitable culture ground for the bacillus.

The sebaceous plugs are found in the middle of the face, especially on the nose and naso-labial sulci, but may be found in any part where the sebaceous glands are large.

(b) The greasy condition of the skin, which is a common feature in the subjects of the "seborrhœides" is characterised in its mildest form by a glistening oily surface which stains tissue-paper In some cases there may be drops of oily fluid. This condition is usually accompanied by dilatation of the sebaceous glands and the fatty plugs just described There is still some doubt as to whether the secretion is simply sweat mixed with fatty matter from the sebaceous glands It appears much more probable that it is really an excess of sweat secretion of oily character The nose the scalp and the middle part of the trunk are chiefly affected

These conditions are not seen before puberty they are commonly associated with acne vulgaris and the "seborrhœides" and are fairly constant features of the "seborrhœic" subject described on p 200

Treatment. *Restriction of fatty and starchy foods* should be advised and any dyspeptic condition treated on the usual lines The local treatment consists in the application of ethereal soaps, alkalies, emulsifying agents lotions containing ether or acetone and sulphur The expression of the oily plugs can be carried out by friction with a soft towel after washing The emulsifying bases containing cholesterol and lecithin and the soapless shampoos may be found useful in this type of skin

Keratosis pilaris Keratosis supra-follicularis

Keratosis pilaris is a common affection of childhood and adolescence characterised by the formation of rough, rasp-like patches on the skin It is estimated that about one person in three is more or less affected. *In some families the condition is constant.* It is first noticed, as a rule when a child is two or three years of age it tends to increase about puberty and commonly disappears later in life It is not infrequently associated with a degree of ichthyosis or xeroderma, and will persist if the latter condition is an ectodermal defect The acquired form appears *to be* related to phrynoderma (p ‥) and like it responds to *vitamin A therapy*

The pilo-sebaceous follicles are dilated and funnel shaped and filled with horny plugs which project above *the level of the* skin to form

acuminate papules. The lower portion of the follicles is atrophied and may contain an atrophied hair. The epidermis between the follicles shows hyperkeratosis as in mild degrees of ichthyosis (MacLeod).

The parts most commonly affected are the extensor aspects of the arms and thighs but the calves forearms and knees and the lower part of the trunk are sometimes involved. The flexures and parts where the skin is soft are unaffected. The skin is dry and feels like a nutmeg grater or rasp. The roughness is caused by numerous pointed papules formed by horny plugs in the mouths of the pilo-sebaceous ducts. The plugs are somewhat adherent, and a lanugo hair is attached to each. As a rule the colour of the lesions is normal, but in some instances the follicles and the adjacent skin are red or purplish, especially in cold weather. The little plugs can be picked out, leaving minute conical depressions. Even if untreated, the papules disappear leaving minute punctate scars, the hair follicle and the sebaceous glands being atrophied.

MacLeod has reported three cases in one family associated with baldness of the eyebrows and scalp and absence of the eyelashes. There were no cicatrices as in the cases described by Taenzer (*vide infra*).

The diagnosis from lichen spinulosum is considered at p. 709.

Treatment. In mild cases, which are by far the most common, the patient rarely comes for treatment. Washing with soft soap and the application of greasy substances, olive oil and lanolin, glycerin, and weak salicylic acid preparations are useful. Many cases are favourably influenced by vitamin A therapy.

Keratosis pilaris rubra atrophicans faciei. Honeycomb naevus. Ulerythema ophryogenes of Taenzer (Gk. *oule* scar *ophyrow* eyebrow). This is a rare disease which has been studied by Taenzer, Unna and Brocq. It occurs more commonly in males than in females, and in young adults chiefly.

The parts affected are the outer-third of the eyebrows and the lower part of the forehead, the scalp and the cheek in front of the ear.

The early lesions consist of prominent hair follicles on an area of diffuse redness. The hairs are later destroyed, leaving small reticular areas of atrophy. Brocq says that moniliform hairs are frequently found associated with this condition of the skin (see p. 40).

Lichen pilaris seu spinulosus

Lichen pilaris is a rather uncommon disease characterised by the formation of fine filiform spines often arranged in groups on the trunk and limbs. Two types may be recognised. The commoner is a disease of childhood, and boys are affected more than girls. This type is almost certainly an ide reaction (*vide* p. 422) and may be associated with ring-worm, tuberculous or focal infections. The rarer type is usually seen in middle-aged women and is occasionally associated with folliculitis decalvans. What may possibly be a third type is seen in association with lichen planus—lichen plano-pilaris. The cause is unknown.

Pathology. There is some doubt as to whether the primary affection is inflammatory or not. Dr Adamson agrees that the first spots may be

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The sebaceous plugs are found in the middle of the face, especially on the nose and naso-labial sulci, but may be found in any part where the sebaceous glands are large.

(*b*) The greasy condition of the skin which is a common feature in the subjects of the "seborrhœides is characterised in its mildest form by a glistening oily surface which stains tissue-paper In some cases there may be drops of oily fluid. This condition is usually accompanied by dilatation of the sebaceous glands and the fatty plugs just described There is still some doubt as to whether the secretion is simply sweat mixed with fatty matter from the sebaceous glands It appears much more probable that it is really an excess of sweat secretion of oily character The nose the scalp and the middle part of the trunk are chiefly affected

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Treatment. Restriction of fatty and starchy foods should be advised and any dyspeptic condition treated on the usual lines. The local treatment consists in the application of ethereal soaps, alkalies, emulsifying agents, lotions containing ether or acetone and sulphur The expression of the oily plugs can be carried out by friction with a soft towel after washing The emulsifying bases containing cholesterol and lecithin and the soapless shampoos may be found useful in this type of skin.

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The pilo-sebaceous follicles are dilated and funnel-shaped and filled with horny plugs which project above the level of the skin to form

epithelial cells. There is no perifollicular inflammation, and no micro-organisms are found in the plug, and the follicle below it is quite normal.

Clinical features. (1) *In children.* The lesions occur more or less symmetrically on the limbs, the neck, the buttocks, and sometimes on the face. They consist of groups of fine filiform spines arising from the pilo-sebaceous follicles. The follicles themselves are slightly raised to form papules the size of a pin's head. There are no symptoms and no active inflammation, the lesions being usually pale, but sometimes slightly redder than the normal skin.

The limbs are usually more affected than the trunk.

(2) *In the adult.* The affection is much rarer It seems to be peculiar to adult women. In a characteristic case the eruption is most developed on the trunk, axillæ, groins and upper parts of the extremities The larger lesions are brownish raised rather blunt elevations situated in the hair follicles. The smaller are pointed papules. They are closely placed, and on passing the hand over the affected area the nutmeg-grater-like surface is recognisable. The spines can be picked out and a conical cavity is left. The affection is essentially chronic but under treatment subsides after several months. At no time are lichen planus papules observed. The hair is thin, but there are no bald areas Graham Little, Dore and Wallace Beatty have described cases of this type associated with folliculitis decalvans. In Beatty's case the first symptom was a gradually developing alopecia, which became almost total. The follicular keratosis which was present on the scalp as well as on the trunk and extremities came on after some years interval. Little's case was almost identical.

(3) In *lichen plano-pilaris* (Pringle) the spiny lesions are associated with characteristic lichen planus (*vide* p. 180).

Diagnosis. Lichen spinulosus is an affection of little importance It has to be distinguished from several other diseases. Keratosis pilaris is a chronic condition of the extensor surfaces of the limbs consisting of small horny plugs covering a rolled up lanugo hair It is of common occurrence in persons who do not bathe frequently Most cases are of congenital origin and are associated with mild degrees of ichthyosis.

In phrynoderma due to deficiency of vitamin A the lesions are blunted and occur mostly on the extensor surface of the limbs. Lichen scrofulosorum may be regarded as a clinical variant of lichen spinulosus for both may be follicular tuberculides. The lesions, however are not spiny but rounded, and occur in groups on the trunk in patients suffering from tuberculosis of the glands, etc.

Lichen trichophyticus or papular trichophytide are synonyms for lichen spinulosus when it is associated with deep ringworm infection (p. 422).

Darier's disease is exceedingly rare. It is differentiated from the second group of lichen pilaris by its distribution, by its early onset and by its vegetative lesions, and the "corps ronds" found in the microscopical sections.

Treatment. Attention should be directed to the primary infection of which lichen spinulosus is often a secondary allergic manifestation. The affected parts should be washed with soft soap, and an ointment containing 10 grains of salicylic acid to the ounce applied.

slightly inflammatory on their first appearance, but his investigations of the histology lead him to believe that the essential part of the process is



Fig 370 Lichen spinulosus × 45

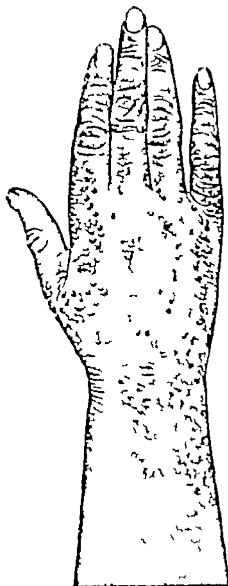
hyperkeratosis of the wall of the hair follicles The section here illustrated is from an adult woman It shows a plugging of the follicular orifice with



Fig 371 Lichen pinulosus

a horny mass which projects above the surface The plugs consist of concentric lamellæ around a hair The lamellæ are made up of flattened

PLATE 68



PITYRIASIS RUBRA PILARIS

Showing the characteristic colour and distribution of the papules on the fingers and wrist

[To face p. [illegible]]

Pityriasis rubra pilaris (Devergie) Lichen ruber acuminatus (Kaposi)

A chronic affection characterised by an eruption of small, red, conical, *or round papules about the hair follicles* on the limbs and trunk, and by redness and scaling which is often extensive and of psoriasiform or seborrhœic type

Etiology The disease is rare in this country The patients we have seen have mostly been between the ages of twelve and thirty five years, but instances of earlier and later development are not uncommon. In London most patients are females but on the Continent males are in the majority The cause of pityriasis rubra pilaris is unknown Occasionally



FIG 872 Pityriasis rubra pilaris. Microphotograph of section ‡

several members of a family are affected A deficiency of vitamin A is probably a factor in its causation (p 80)

Pathology The lesion is a hyperkeratosis of the follicular orifice around the hair The stratum granulosum may be hypertrophic while the corpus mucosum is thinned. The papillæ are congested and infiltrated with cells, and in the older papules the deep parts of the hair follicles are *chronically inflamed.*

Clinical features. Pityriasis rubra pilaris has very definite characters The eruption consists of papules of a pale pink, red, brownish, or yellowish colour situated at the hair follicles The individual lesions vary in size from 1 to 3 millimetres they are at first discrete but in time become closely aggregated to form patches or plaques involving considerable areas The papules are more closely set in the central part of the affected area than at the periphery

The lesions are hard, and a surface covered with them feels like a very coarse rasp or nutmeg-grater A close examination of a papule shows a central horny punctum which contains an atrophied hair often curled up.

Although these follicular lesions are peculiar and striking the clinical picture is completed by extensive areas of bright pink scaly psoriasiform eruption. If patchy the margins are usually well defined but the outlines are irregular, show indentations and enclose islands of normal skin.

The face is often the seat of a diffuse red scaly eruption, the appearance sometimes suggesting that of a Red Indian. The scalp is covered with a copious branny scurf while the palms and soles are dry and horny and have a reddish-leathery appearance which is characteristic. On the elbows and knees the aggregation of the papules forms scaly plaques which simulate psoriasis.

On examination special attention should be given to the backs of the hands and the dorsal surfaces of the first phalanges of the fingers, where the lesions are in the form of minute horny plugs at the orifices of the hair follicles, or small groups of perifollicular papules with a scaly cap (Plate 62). The elbows, knees, wrists and forearms are usually involved. On the trunk the eruption in some instances is more developed upon the upper part, the neck, shoulders and chest, while in others the waist and the lower abdomen are chiefly affected. In many cases the greater part of the trunk and limbs is involved and the whole surface may become scaly and red—a generalised exfoliative dermatitis (*vide* p. 275).

The nails are soft, and longitudinally striated like a cane.

There is a variable amount of itching and the patient may complain of the skin feeling tense. The general health is unaffected. The disease runs a chronic course with intermissions and relapses.

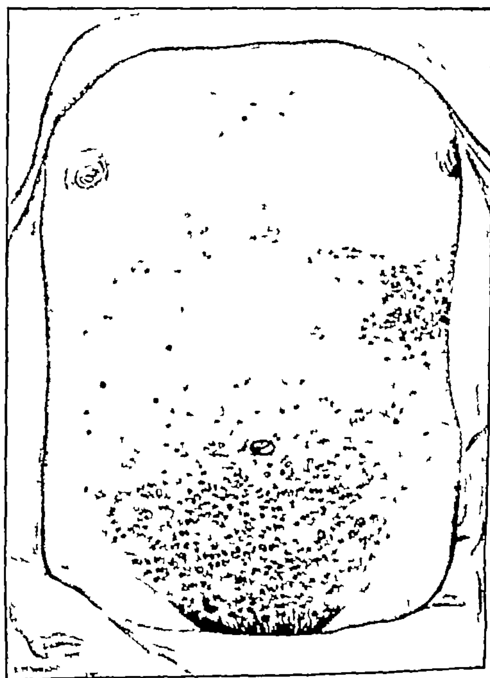
Sequeira had under his care a child who at different times suffered from psoriasis and pityriasis rubra pilaris. Dr Adamson has also seen this association. We recognise that in certain phases of the disease it may be impossible to distinguish it from a generalised psoriasis.

Diagnosis. The characteristic features of pityriasis rubra pilaris are the black conical plugs on the backs of the fingers and the rasp-like surfaces due to the closely-set hard papules. Exfoliative dermatitis (pityriasis rubra) is more hyperæmic, and scales are larger and more abundant. Papulation is absent. In psoriasis the lesions increase by peripheral extension, while in pityriasis rubra pilaris they are all about one size and the face and scalp are the seat of diffuse red, scaling areas. Psoriasis rarely affects the face, and the spots are circumscribed. Ichthyosis, especially the form known as keratosis pilaris, might possibly lead to error, but the horny plugs are non-inflammatory and develop in infancy and persist throughout life. On the scalp and face pityriasis rubra pilaris may simulate seborrhœic dermatitis.

Prognosis. The general tendency of the disease is to spontaneous cure, but the duration is usually from three to eighteen months and relapses may occur.

Treatment. No specific therapy of pityriasis rubra pilaris is known but full doses of vitamins A and C with complete rest in bed during the acute stage are likely to yield some improvement and vitamin A may be given for several months with advantage. Locally some relief is afforded by cooling lotions such as glycerol plumbi subacetat. 1 ounce, glycerin 1 ounce, water to a pint, a lotion of 2 per cent. liquor picis carbonis, or a zinc cream with ichthyol. The salicylic acid ointment may be tried, but

PLATE 63



DARIER DISEASE

layer are found round bodies with a highly refracting membrane, and containing a nucleated protoplasm. These large rounded cells "corps ronds" of Darier somewhat resemble the molluscum bodies in molluscum contagiosum, and may be due to an intracellular virus, but this has not been established. The papillæ are hypertrophied

Clinical features. The primary lesion is a papule, varying in size from a pin's head to a pea, capped by a greyish-brown crust. On removing the horny crust a funnel-shaped cavity is exposed, from which a soft plug can be extracted. The cavity is a dilated sebaceous orifice. At the onset the skin is rough, and has a dirty appearance. As the disease progresses more and more follicular lesions appear and form wart-like masses In parts which are moist, such as the groins and axillæ, they develop into vegetations of globular or crateriform form and give off an offensive odour (Plate 63)

The eruption is symmetrical and affects the face, especially the naso-



FIG 874 Darier's disease. Abdomen and thigh of woman, æt. 54. From water-colour drawing of Sequeira's case.

labial furrows and the temples and the scalp, but it does not lead to baldness. It is also found over the sternum and between the scapulæ, in the flexures of the limbs, about the waist and the perigenital regions. Only in advanced cases are the extensor aspects of the limbs and trunk involved. The hands and feet are sometimes affected, and there are often flat warts on the hand and minute points of hyperkeratosis on the palms and soles. In one case the eruption appeared suddenly on the flexures of the elbow and then slowly spread to the hands a little later the chest was involved, and then the abdomen and the thighs and legs. The patient complained of considerable irritation of the skin, especially in the warm weather The skin of her face was coarse and dark, and there were scattered discrete papules of the same colour as the rest of the skin. The scalp was covered with masses of greasy scales, and the hair was coarse and scanty On the chest and upper abdomen the papules were the size of pins heads, and discrete, but on the abdomen some of the lesions were an eighth of an inch in diameter and closely packed together When admitted to the ward the colour of the skin in the groins and lower abdomen

dithranol tar X rays are without effect. Ingram has seen improvement follow gold injections and applications of ointment containing vitamins A and D

Keratosis follicularis (Darier's Disease, Psorospermosis follicularis vegetans)

A chronic symmetrical disease *characterised by follicular crusted* papules with a peculiar form of keratinisation.

Etiology The cause is unknown. The disease is rare and according



FIG 678 A "Corps ronds of Darier B. Fissure in deeper layers of rete C. Plug of stratified horn-cells and débris. Dr Graham Little's case of Darier's disease

to Darier occurs rather more frequently in males than in females Sometimes there are small family outbreaks and Pohlmann has described cases occurring in three generations which supports the view that the condition is a congenital abnormality and at times familial When Darier first described the disease in 1896 he called it psorospermosis" because he believed that certain peculiar rounded bodies, to be described under pathology were coccidia or psorosperms *but he later* held that these "bodies are epidermal cells imperfectly keratinised

Pathology The top of the crust is formed by *thickened horny* epidermal cells and these are mixed with curious grain like cells which are horny and nucleated In the corpus granulosum and in the mucous

A valuable contribution to the study of the development and pathology of the hair is the book on "The Hair and Scalp," by Agnes Savill. (E. Arnold & Co. 1945).

Canities (Lat. *canus* hoary or grey)

Canities or greyness of the hair is usually acquired.

In the condition known as albinism the hair pigment is congenitally absent and in some cases there is a local absence of hair pigment in a small area. The latter condition may occur through several generations.

Acquired canities is in most cases a senile change, but in many instances the hair becomes grey in early adult life and middle age. In some families there is a tendency to the early development of canities. Acute febrile illnesses and cachectic conditions may be followed by greyness, and there is no doubt that mental strain worry shock and the like play an important part in its development. Neuralgia and severe headaches are also sometimes followed by the appearance of white hair in the affected area. In characteristic cases of canities the blanching of the hair is first noticed on the temples, and later scattered hairs over the rest of the scalp moustache and beard regions become white, producing a diffuse alteration in colour Ultimately with exacerbations and retardations of the process the whole hair may become white

Cases in which the hair has become grey or white in a few hours or a few days are very rare, but authentic instances are on record.

Patches of white hair are common in leucodermia (p. 190), and the new hair growing upon a patch of alopecia areata is usually non-pigmented at first, and, indeed, may never recover its normal colour (p. 180).

The whitening of the hair is due to absence of pigment or to the presence of air-bubbles in the cortex. The absence of pigment in the hair shaft may be dependent upon imperfect formation in the papilla or as Ehrmann has suggested, to a defect in the transmission of the pigment to the hair cells. Vitamin deficiency may be a factor

Cases in which the pigment has been restored after the development of canities are rare but the degree and extent of canities may vary in the same patient from time to time

Treatment. The use of hair dyes is not to be recommended. Solutions of nitrate of silver (3 per cent.) are used to produce a black tint, and pyrogallic acid (2 per cent) for a brown.

Several of the so-called harmless hair-dyes (para phenylene diamine etc) may cause a severe dermatitis and subsequent alopecia (*vide* pp 320 and 343). Reliable preparations of henna appear to be harmless

Alopecia (Gk. *alopekia* fox mange)

Alopecia or baldness may be congenital or acquired local or general. The acquired forms may be cicatricial or of nervous or toxic origin, but the cause of the common type is unknown. Syphilis should be excluded by blood tests.

Congenital alopecia is very rare but sometimes runs in a family Sequeira had four cases of complete congenital absence of hair two in

was so black as to suggest acanthosis nigricans, but after bathing the brown colour became apparent. On the labia majora and in the groins the lesions reached their maximum development, forming papillomatous tumours. The limbs were much less affected than the trunk and the papules on them were always discrete and of small size. The nails were opaque and brittle The mucous membranes were unaffected. The patient was forty three years of age and had had the disease for many years It usually starts between the ages of eight and sixteen or later There are no general symptoms and the eruption remains stationary for an indefinite time

The **diagnosis** is made by the curious appearance of the crusted papules and the funnel shaped plugs seen when these are removed. In a doubtful case a microscopical examination should be made, when the appearance of the rounded bodies and the grain like cells make the diagnosis clear

Treatment. The disease is not easily influenced by treatment but frequent bathing and the use of medicated soaps and ointments containing salicylic acid and resorcin improve the condition Grenz ray therapy is said to be very effective and improvement has been seen after X ray treatment. Doses of 100–150 r may be given to large areas and repeated at two weeks intervals for three applications Relapses may occur but it is safe to repeat such fractional X ray therapy after an interval of three months Large doses of vitamin A may be effective (p 70).

Acanthosis nigricans is described in the chapter on General Diseases (p 109)

DISEASES OF THE HAIR

We have already discussed the affections of the hair follicles caused by pyogenic organisms, follicular impetigo (p 453) boils (p. 454) sycosis barbæ (p 459) sycosis nuchæ (p 463)

In this place mention should be made of " ingrowing hairs which often account for superficial pustules apt to be mistaken for sycosis. Familial cases are not uncommon The condition is usually corrected by fractional X ray therapy and a different direction of the razor in shaving

In the chapter on Vegetable Parasites ringworm of the scalp (p 412) favus (p 410) tinea barbæ (p 421), piedra and trichomycosis axillaris (p. 424) were considered.

Keratoses of the hair follicles were described on p 700 and neoplasms at p 668

We have now to consider certain special affections of the hair and it is convenient to recall the fact that the growth of hair depends to a remarkable degree on certain internal secretions Hypothyroidism and hypopituitarism are attended with decreased activity of the hair follicles. We have seen cases in which alopecia has followed partial thyroidectomy for Graves disease.

Hypertrophy of the supra renals is associated with excessive hair development even in young children.

The menopause is frequently followed by hypertrichosis of the face and a moderate hair fall on the vertex. A similar condition occurs after the removal of the ovaries

Eunuchs do not suffer from the form of baldness so common in middle age (Sabouraud).

to maintain the patient's confidence but little else should be expected from them.

Secondary alopecia of the diffuse type. Fall of hair sometimes complete, occurs in the acute fevers typhoid, erysipelas pneumonia etc. or it may be postponed to the convalescent stage. It has been particularly common after some influenza epidemics Sequeira has seen a number of cases in which there has been a great loss of hair occurring with parturition One patient under his observation lost her hair completely in three successive confinements and after the third the alopecia was permanent. Grave mental shock has also been known to cause a rapidly-developing baldness. Severe electric shock has also been followed by loss of hair

In certain general skin affections the hair falls off this is especially the case in general exfoliative dermatitis. Syphilitic alopecia is a special form. It occurs usually during the first year after infection the hair does not come out over large areas, but there are narrow bald patches, giving the appearance of glades in a forest (Fig 287).

Fall of hair is a common symptom of myxœdema. In the Lorain type of infantilism the alopecia may be universal The response to thyroid treatment in this rare condition is well shown in a series of photographs in the *Practitioner* 1916 I., p. 26 In many chronic diseases attended with general cachexia loss of hair occurs. In the female it has been noticed after oophorectomy and ovarian disease

Alopecia areata

An affection of the hair dependent upon general nervous or constitutional factors, characterised by one or more bald areas without obvious change in the skin It usually affects the scalp The condition is dealt with in the section on constitutional diseases, p 185

Cicatricial or Atrophic Baldness

These conditions differ from the functional alopecias in that the integument of the scalp becomes thinned and atrophic from idiopathic degeneration, or from pressure causing ischaemia or a terminal fibrosis after severe inflammation. The causes in the order of their clinical importance are —

(1) *Trauma and infections* The scars of wounds of the scalp are usually small, for healing is generally rapid. Burns are very apt to leave large areas of cicatricial alopecia especially if coagulants are used or firm scabs are allowed to form during treatment.

Pus-coccal folliculitis, including sycosis capitis often destroys hair follicles and so may pustular ringworms (kerions) and favus. Varicella, variola, and zoster leave their pitted scars and larger areas mark the sites of boils, carbuncles, lupus vulgaris, gummatous syphilides, sarcoid and leishmaniasis.

(2) *Skin affections ending in atrophy* such as lupus erythematosus, lichen planus, lichen ruber pilaris, lichen spinulosus ulerythema ophryogenes morphoea, scleroderma, etc.

(3) *Diseases apparently peculiar to the scalp* e.g., pseudo-pelade folliculitis decalvans, chignon alopecia.

brothers, and three cases in which the absence was *partial and limited*. The latter condition may be looked upon as a form of nævus. In one of the complete cases there was also a congenital dystrophy of the nails (*vide* Fig. 23). The cases are usually minor forms of ectodermal defect (see p. 59).

Diffuse Alopecia

Senile or masculine type Calvities. This is the commonest form of diffuse alopecia.

Etiology. This type of baldness begins in the third decade. The scalp may or may not be scurfy, but there is often a history of scurf and seborrhœa about puberty. Familial and endocrine factors are of primary importance.

Worry, anxiety, overwork, cachectic conditions, and probably dietetic irregularities favour its development. Want of attention to the scalp, heavy and ill-ventilated hats and caps are possible local causes by restricting the blood supply which comes mainly from the frontal and occipital vessels. While much more common in the male than in the female it is occasionally seen in greater or less degree in women after the menopause.

Pathology. The hair follicles undergo a gradual atrophy, very similar to the atrophy which is a senile change.

Clinical features. Premature baldness of this type begins at the vertex, and at the sides of the frontal region. It gradually, or sometimes rapidly, extends until the lateral bald areas on the forehead coalesce with the enlarging tonsure-like patch. Sometimes a small island of hair of normal length *remains in the middle of the forehead*, but ultimately the scalp becomes denuded, except in the occipital and temporal regions.

The "Hippocratic" scalp is shining, smooth, commonly pale, and the surface looks atrophic. From time to time scaliness may return, and there is often excessive perspiration.

Senile alopecia proper is not attended with the development of scales, but it is not uncommon to find cases in both sexes in which from want of attention brownish greasy scales form. In the subjects of "*seborrhœic dermatitis*" *the hair of the beard region, the eyebrows*, and the hair of the trunk may be similarly affected, and seborrhœic conditions should be treated although their influence upon alopecia is doubtful.

Prognosis. Provided the condition is treated early enough there is a possibility of retarding the development of premature baldness, but in advanced cases nothing can be done. The rapidity of the fall of hair is of little significance unless the peculiarities of the individual are known. Prognosis depends on the general health, familial factors and the amount *of hair lost. Regrowth may depend on the nervous* or emotional health of the individual.

Treatment. The underlying "seborrhœic" condition requires the use of antiseptic lotions, resorcin, euresol (*monoacetate of resorcin*), sulphur and mercury being those most commonly used (*vide* Pityriasis, etc., p. 203). Endocrine therapy, especially in the female, should be tried.

Any deviation from the general health must be *attended to and* nerve strain, etc., must be avoided. Local measures as for alopecia areata help

baldness, but in the former their margins are red and scaly and there are usually symmetrical lesions on the middle of the face and on the auricles.

Treatment. The treatment of pseudo-pelade is very unsatisfactory. Arrest of the condition sometimes follows a course of gold injections. Local therapy appears to be unimportant.

Folliculitis decalvans. Under this name two conditions are described.

(1) The folliculitis decalvans of Quinquaud, a chronic affection of the hair follicles of the scalp causing extensive cicatricial alopecia. The clinical features are irregular bald patches rarely larger than a shilling with inflammation of the hair follicles at the margin. The inflammation is not usually purulent thus differing from the staphylococcal varieties of folliculitis. Pus-cocci have been found in the perifollicular inflammation, and Quinquaud described an organism which he believed to be peculiar to the condition, but the findings are inconstant and no specific causal organism has yet been identified. The hair is permanently lost.

The treatment recommended is the painting of the affected areas with tincture of iodine or with a solution of perchloride of mercury one-sixth grain to the ounce. We have had success with sulphathiazole by mouth and ung. quinolor co. (Squibb) locally.

(2) The second type is more diffuse and may be regarded as sycosis capitis. Often it involves the scalp as an extension of sycosis barbæ or sycosis nuchæ when the diagnosis is not questioned. The latter condition, also called dermatitis papillaris capillitii produces focal areas of cicatricial alopecia and the atrophic areas tend to become cheloidal (*vide* p. 463, Fig. 241).

Perifolliculitis capitis abscedens et suffodiens (p. 216) also gives rise to a scarring alopecia.

Chignon alopecia as described by Sabouraud is a rare affection occurring in women between the ages of thirty and fifty. A gradual fall of hair followed by atrophy is observed about the mid-line at the back of the vertex from whence it spreads towards the occiput in one or two oval areas. Seborrhoeic scales may cover the site. Although formerly attributed to the pressure of pads, combs or coils of hair the etiology is obscure and treatment of no avail.

Hypertrichosis. Hirsuties (Lat. *hirsutus* shaggy)

Hypertrichosis may be congenital or acquired.

We have already discussed the congenital anomalies called hairy moles (p. 48) and the rare cases in which there is excessive development of lanugo hairs as a congenital peculiarity. This is a persistence of the fœtal hairs, which increase with age. The development is symmetrical, and parts are affected which normally are devoid of strong hairs. The whole of the face may be covered, producing the deformity which is sometimes on exhibition in shows, etc. dog-men, etc. The hair is always soft and woolly and fine.

Hypertrichosis in adult life occurs in both sexes. In the male it is simply an exaggeration of the normal condition. It begins about puberty or sometimes earlier. The regions ordinarily covered with hair are particularly affected, but the chest and back and the limbs may be covered with such a quantity of strong hair as to suggest an anthropoid ape. The hairy

(4) *Radio-dermatitis* Accidental in ringworm treatment or inevitable in cancer therapy

Pseudo-pelade of Brocq (Fr *peler* to remove hair from hide) A chronic dystrophy of the hair follicles, terminating in cicatricial atrophy

Etiology The cause of the condition is unknown Young subjects and adults are affected and males suffer more commonly than females. We have seen it associated with alopecia areata

Pathology The evolution and character of the lesions suggest a parasitic infection. but in spite of elaborate researches no fungus or



Fig 375 Pseudo-pelade

bacterium has been discovered. The follicles are surrounded by dilated vessels and lymphocytic infiltration The ultimate result is atrophy

Clinical features The onset is insidious small atrophic bald areas developing There may be some slight scaling at the follicular orifice The hairs fall to leave smooth depressed white areas like " footprints in the snow At first the bald areas are small but, by extension and the fusion of adjoining areas form patches with a festooned outline or figures suggesting a group of islands on a map The patches are devoid of hair definitely cicatricial, and abruptly limited There are no broken hairs but many show slight irregularities of shaft and sheath

Dystrophies of the nails occasionally occur in the subjects of pseudo-pelade

Diagnosis The condition differs entirely from common alopecia but has close resemblance to the other varieties of cicatricial alopecia

Patches of lupus erythematosus and lichen planus lead to cicatricial

Idiopathic Trichoclasia is a rare condition described by Sabouraud in which partly bald areas are formed by the breaking of the hairs within a centimetre of the scalp Congenital hypotrichosis may present a similar but more extensive affection (p. 60).

Sequeira had a boy brought to him with a diagnosis of ringworm of the scalp and it was discovered that the partly bald areas covered with short broken hairs, were caused by his being plucked by his disapproving school mates. The artefact variety of alopecia gives an identical clinical picture and is next described.

Trichotillomania is the name given to a neurosis of young women who pull out or break off the hair It is often associated with other factitious dermatoses (Gk. *thrix* hair *tillo* I pluck, *mania* madness). It is to be regarded and treated as a neurotic tic

Affections of the Sweat Glands

The sweat glands may be affected functionally or organically

Functional affections. The excretion may be altered in quantity or in quality The term *anidrosis* is used for diminished excretion *hyperidrosis* for excessive secretion. *Bromidrosis* is the name given to offensive perspiration, and *chromidrosis* is used to designate alteration in colour

The congenital variety of xeroderma is due to an absence of sweat glands, an ectodermal defect (p 58) and neither this condition nor the local varieties due to atrophy should be included in the functional affections of the sweat glands.

Anidrosis. There does not appear to be any condition in which the excretion of sweat is completely suppressed, but it is diminished in quantity in certain general and local affections.

The general conditions causing anidrosis are diabetes, renal disease, myxoedema and some cachexias due to malignant disease. Some degree of anidrosis is not uncommon in the aged from senile atrophy of the sweat glands

Certain drugs, *e.g.*, atropine and arsenic may cause anidrosis.

Nervous affections sometimes cause local anidrosis, *e.g.*, transverse myelitis, infantile paralysis, and anaesthetic leprosy Sweating is abolished after complete sympathectomy and is the sequel of surgical treatment of Raynaud's disease and Bazin's disease.

Local conditions of the skin causing anidrosis are the congenital anomaly ichthyosis and its less severe stage, xeroderma, senile degeneration of the skin, some forms of cutaneous atrophy scleroderma. Sweating is masked in psoriasis and eczema by hyperkeratosis.

Where the anidrosis depends upon some cause like diabetes or myxoedema, the treatment is on the lines required by the general disease. Diaphoretics are of little use in the local forms, but benefit may be derived by treating such conditions as xeroderma, and the cutaneous eruptions like psoriasis, etc Turkish baths may be of service and pilocarpine may be used.

Hyperidrosis. There is a great deal of variation in the amount of sensible perspiration in different individuals without any alteration in the

Pili torti is a rare congenital anomaly sometimes familial, in which the hairs are irregular and twisted and break off short. The hairs are flattened and not beaded as in the case of monilethrix. Scott 1946, demonstrated follicular changes and Hellier and Astbury 1940 investigated the physical properties of twisted hairs

Monilethrix (Lat *monile* necklace) This is a rare congenital and familial affection characterised by an *alternate narrowing and swelling of* the hairs Sabouraud described a family in which sixteen out of thirty-five known members in five generations showed this anomaly McCall Anderson found twenty five cases of monilethrix in fifty seven children who had one parent affected The nodal portion is the normal thickness of the hair *The medulla is absent between the nodes and may be* irregularly distributed The hairs are dry brittle and short and the swollen parts are excessively pigmented. If an affected hair is placed in water the nodes *swell* remarkably showing that the nodal portions are hygroscopic The scalp is scaly and dry and follicular hyperkeratosis is present The changes are *probably due to varying activity of* the hair papillæ

Treatment A single X ray epilation causes temporary improvement. This may be repeated at intervals of not less than six months with more permanent effect as demonstrated by Ingram

Ringed hair Leucotrichia annularis. This is a very rare condition characterised by alternate *narrow rings* of white and normal tint occurring in otherwise healthy hair It is believed to be due to minute bubbles of air in the hairs In some cases the condition has been congenital and Dr Galloway found it in two brothers The cause is unknown.

Leptothrix (Gk. *leptos* fine) This name is given to a common condition of the hairs of the scrotum and axillæ characterised by irregular lobulated concretions lying on the shafts

Etiology Warmth and moisture appear to be necessary for the development of leptothrix. Various organisms have been *found in the* lesions and in some cases the sweat was infected with the bacillus prodigiosus

Clinical features The affected hairs are brittle and when removed show irregularly placed *concretions attached to the shaft In advanced cases the hair appears to be much thicker than normal and on examination* the thickening is found to consist of lobulated concretions the whole length of the shaft the appearance suggesting the feathered end of an arrow The fibres of the affected hairs may be split and the fractured ends may be clean-cut or brush like

Treatment Shaving or close cutting of the hair and the application of antiseptic lotions such as 1–1 000 corrosive sublimate are recommended.

Piedra Trichosporosis somewhat resembles leptothrix and the affected hairs on the scalp beard or eyebrows and moustache present *minute* dark brown and hard nodules on their shafts These are due to a fungus the trichosporon and the condition is described on p 424

Trichomycosis axillaris flava, rubra et nigra are similar affections of the axillary hair due to a nocardia (p 424)

Trichonodosis *is the name given to knotted hair* The knots appear just above the scalp surface and appear to be caused by trauma acting upon peculiar flat dry hairs

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are subject to acrocyanosis, perniosis and hyperidrosis of the palms and soles. The lesions may appear as early as the sixth month, but more often between the ages of one and five years and even later in childhood. The disease usually clears up at puberty but may persist to early adult life with traces for years later. The nose and occasionally the upper lips and cheeks are involved. The affected areas are constantly moist from the exudation of sweat, and there are a number of small papules of a red colour about the size of a pin's head or little larger. The surface of the nose generally is rather livid. Hallopeau points out that the affection may be hereditary for many familial cases have been reported. Cockayne states that the disease is so rare that the occurrence of two or more cases in so many families cannot be due to chance and there must be a predisposition to it.

Histologically there is a cellular infiltration about the sweat glands. Mono-nuclears, plasma cells and giant cells are found and the sweat glands may show hypertrophy and their ducts be dilated so as to form small cysts.

Treatment of hyperidrosis. Anæmia and other underlying conditions should be treated on the usual lines. Alcoholism is a common cause in adults and should be avoided. The abuse of tobacco also tends to produce hyperidrosis. Atropine 1/100 grain subcutaneously injected, or given in pill, and belladonna may be tried, but require careful watching. We prefer to use moderate doses of tr. belladonnæ in a bromide mixture and particularly in the emotional type to give small doses of phenobarbitone and vitamin B complex, combined with simple psychotherapy.

Locally great benefit is found from frequent bathing of the affected parts in hypertonic saline, followed by the application of a saturated solution of alum or liquor hydrarg. perchlor. or lead lotion containing 25 per cent. spirit. Sodium hexametaphosphate solution in water 1 to 2 per cent., is often very successful. It may also be used in powder form with zinc oxide and talc. Antiseptic soaps are also of service. Where the circulation is bad, electric baths, hot baths, and massage may be found beneficial. In sweating of the feet the parts should be bathed twice a day, the socks should be changed daily and powders dusted over the parts and into the socks. Boric acid alone or in combination with salicylic acid, or resorcin 2 per cent., may be used. Two or 3 per cent. of formalin in saline is useful if not irritating and is best tolerated by the feet. For sweating of the armpits, hot sponging followed by a 1 per cent. solution of quinine in spirit or eau de Cologne is useful, or a dusting powder containing 3 per cent. of salicylic acid in talc or in bismuth subgallate may be applied.

Moderate X-ray dosage is a useful ancillary measure and a safe technique is to give 200 r through 1 millimetre aluminium filter repeated in two weeks for three doses only and not to be repeated until an interval of at least three months has elapsed. Dosage carrying any risk of X-ray atrophy is unjustifiable.

Travellers in the tropics find that keeping the axillary hair closely shaven affords relief and comfort, and is commonly practised in East and Central Africa.

In granulosis rubra nasi similar astringent applications and also the X-ray treatment may be used, but the disease tends to spontaneous cure.

Bromidrosis. Fœtid sweating of the feet, axillæ and groins. As a rule there is also hyperidrosis, the sweat undergoing decomposition, with

general health. Excessive sweating may be due to general or local causes.

General causes. Many toxic and bacterial diseases are attended with profuse perspiration. It is common in malaria, phthisis, septicæmia, typhoid fever, influenza, pneumonia, and in attacks of gout. It is a feature in defervescence in any febrile condition and occurs in the moribund from any cause. Rickets, obesity, exophthalmic goitre and allied conditions, chronic intoxication from alcohol, lead and arsenic are also factors.

Nervous conditions cause hyperidrosis. Emotional sweating is usually most evident on the palms and in the axillæ, but the soles and the perineal region are often involved. Sufferers from neurasthenia, hemiplegia, tabes dorsalis, transverse myelitis, peripheral neuritis, and affections of the sympathetic may all perspire excessively. In tabes a band of sweating around the body is a rare type of crisis. Very rarely some gross organic disease of the brain, such as a tumour, may cause local hyperidrosis. Sequeira has seen it also in the area of herpes frontalis after the healing of the vesicles. Unilateral sweating has also been noted after hypothalamic lesions in encephalitis lethargica, but hemidrosis (sweating of one half of the body) may be functional or hysterical in origin.

Stimulation of the sympathetic induces hyperidrosis and unilateral sweating of the head accompanies irritation of the cervical sympathetic by an aneurysm or tumour.

Local hyperidrosis occurs on the *scalp* in the bald and in many sufferers from oily seborrhœa. In the latter condition the hat lining, pillows, etc., are constantly stained by the excretion, which appears to be partly hyperidrosis and partly excess of oily matter from the sebaceous glands.

The *face.* Unilateral sweating of the face is occasionally met with. Some curious cases of heredity have been recorded. It may be looked upon as an affection of the sympathetic. Mastication and the ingestion of acids such as vinegar may excite it. Sequeira had under observation a man who carried about a supply of mustard pickles, which he ate to demonstrate the anomaly. We have seen similar cases.

The *axillæ.* Sweating is often excited abundantly in the axillæ of patients who strip for examination. This may be emotional or due to exposure. Excess of sweat in the axillæ occurs in the gouty, rheumatic, obese, and nervous subjects. In some cases it is particularly trying for the patient, especially for women, as the clothing is rapidly spoiled. In many instances there is fœtor (*vide* Bromidrosis). Exertion and emotion increase the secretion.

The *groins* are affected in a similar way to the axillæ, but the trouble is rarely so severe. Emotional sweating of the genital regions is common.

The *extremities.* Hyperidrosis of the palms and soles is very common. In many cases there is acro-asphyxia, the affected areas being cold, clammy and blue or dead white in colour. In others there is evident hyperæmia. On the soles the skin may become macerated, and vesicles and blisters form, rendering walking painful and difficult. Secondary decomposition of the sweat with bromidrosis is common. Flat foot is often associated with hyperidrosis, and appropriate orthopædic treatment often gives immediate relief.

Nose. **Granulosis rubra nasi** (Jadassohn) is a rather rare affection, occurring in children. As a rule the children are frail and ill nourished and

genuine cases associated with grave toxæmia, purpura, vicarious menstruation, and in neurotic subjects, in which blood has been seen to come from sweat glands. Dr Still recorded a case in a girl of 12. Treatment must be directed to the general cause if discovered.

Sudamina, sweat rash is an eruption of small non-inflammatory superficial vesicles containing sweat.

Etiology The eruption is common in acute fevers, particularly acute rheumatism and enteric fever in the crisis of pneumonia, and in the moribund, but it may occur independently Over-clothing and hyperidrosis are the main factors.

Pathology The vesicles lie in the stratum corneum and the ducts of the sweat glands open into them

Clinical features The onset is sudden, the rash appearing on any part of the body or face but it is most common on the chest and neck. The skin is of normal colour and scattered over it are numbers of minute vesicles usually discrete but occasionally confluent, containing a clear fluid and looking like dewdrops. There is usually no itching and the vesicles dry up in a few days, leaving no stain. No treatment is necessary apart from washing and ventilating the skin.

Prickly heat, miliaria rubra, lichen tropicus is an acute eruption of minute papules and vesicles at the orifices of the sweat glands and is very common amongst white people in the tropics. The affection differs from sudamina because the lesions are inflammatory and whether this is due to secondary infection, scratching contact with clothing or to some constitutional predisposition is not fully established Because of the observations of Smith of Lagos we have included the disease in the monilia infections (p. 428).

Dyshidrosis exfoliativa. In tropical countries excessive sweating on the palms is sometimes attended by the exfoliation of large flakes of epidermis. The condition is called dyshidrosis exfoliativa. It differs from cheiropompholyx in the complete absence of vesiculation.

Hidrocystoma. Hidrocystoma is the name given to a cystic dilatation of the sweat glands and ducts occurring on the face in middle-aged women whose employment, such as laundry work, exposes them to heat and moisture

Histologically the lesions are dilatations of the deeper parts of the sweat gland ducts apparently produced by obstruction of their lumen in the upper part of the corium. The causation is obscure. Darier believed the condition was due to a congenital anomaly (*vide* hidradenoma p. 03)

The lesions are discrete scattered vesicles upon the forehead and nose, eyelids and cheeks, and occasionally upon the lower parts of the face and upon the neck. The vesicles vary in size from a pin's head to a pea, and contain a clear slightly acid fluid, which gives them a clear or bluish tint There is always profuse perspiration. The individual lesions dry up in a week or two but the eruption persists during the hot weather and usually disappears entirely in the winter In cases of unilateral sweating the condition has been observed on the affected side only

Puncture of the vesicles with a sterile needle and the application of mild antiseptic lotions followed by an astringent powder are recommended.

Tumours of the sweat glands are considered at p 800

secondary fermentative changes due to infection with various saprophytic organisms

Those who have to stand a great deal at their work servants, and others and particularly the flat footed are the most frequent sufferers from bromidrosis of the feet. Axillary *bromidrosis is common, and a great* annoyance to the patient It is often dependent upon emotion and is due to the activity of the apocrine *glands of the axillæ and genital regions.* These glands correspond to the odoriferous glands of animals and are under the influence of sex hormones

Treatment Boots and shoes soaked in the fœtid sweat should be got rid of The feet should be washed twice daily and an antiseptic such as potass permanganat. 1/1 000 salicylic acid 5 per cent. or formalin ½ to 3 per cent. in alcohol and water applied. Bemans advocates the use of glycerin to prevent the formation of ammonia which damages the epidermal keratin. The socks should be changed every day and in mild cases this daily change with regular bathing and the application of boric powder is sufficient If the parts are excoriated, peroxide of hydrogen xeroform or dermatol should be first applied. There is sometimes great difficulty in getting rid of patches of thickened epidermis but dabbling in 3 per cent formalin saline solution for twenty minutes daily and then drying and powdering usually exfoliates the thickened horny layer The axillary cases are treated as for hyperidrosis, any underlying condition of the general health receiving attention Lamb advises 20 per cent. sod bicarb lotion.

The body odour of the female is sometimes relieved by *œstrogen* therapy

Chromidrosis. Many *of the recorded cases of coloured sweating are* doubtless impostures but there are a few authentic instances. *The face eyelids cheeks forehead and (rarely) the hands and feet are affected.* The sweat may be dark brown or black the pigment probably being a derivative of indican, as the patients are always constipated. *Blue sweating* from pyocyanin, and green yellow and red varieties have been recorded. A pseudo red sweat from growth of the bacillus prodigiosus in the moisture of the axillæ also occurs and yellow or brown tints may be produced by other chromogenic organisms

The sweat may also be coloured from the use of drugs etc pink by iodides, green from copper blue from iron. More often staining of the axillæ is derived from a coloured undergarment.

Sequeira has not met with a case of coloured sweating at *the London* Hospital, and the fact that it occurs nearly always in hysterical subjects should lead to careful investigation before the diagnosis is made. One *girl* of fifteen came to the clinic with a bright *carmine-coloured deposit* in the face It was alleged to be a red sweat but proved to be due *to a dye The colour was easily removed by washing with cold water* Attention to the general health and the use of aperients are necessary and the local *application* of a mild antiseptic lotion may be required.

Phosphorescent sweat is rarely seen but is said to occur after the use of phosphorus medicinally and from taking fish Phosphorescent bacteria are the probable cause.

Hæmatidrosis. Bloody sweat has been described, but in most cases depends upon an error of observation or *fraud. There are, however*

should be soaked in hypertonic saline baths twice a day followed by gentle expression of any pus. After careful drying a spirit antiseptic paint, e.g., liquid phenol ℥15, weak tincture of iodine ʒ2, industrial methylated spirit to 1 oz., should be applied with a small brush this will instantly flow by capillarity all round the nail plate Once a week small pledgets of cotton-wool moistened with liquid phenol should be tucked out of sight under the swollen nail fold. One minute later the pledgets are withdrawn and the excess of phenol removed by swabbing with tincture of iodine. In obstinate cases small doses of X rays (150 r) may be given and repeated several times at one to three weeks intervals. Treatment must be continued for several months, during which time unnecessary wetting of the hands should be avoided. In acute phases penicillin injections or a sulphonamide may be indicated.

Mycotic infections of the nail (onychomycosis). These infections are usually due to ringworm (which have been described elsewhere see p. 404), but yeasts and the epidermophyton are not uncommon causes, and in some cases it would appear that saprophytic moulds may be the etiological agent. Where scales are abundant, as in some nail dystrophies, saprophytic organisms are likely to flourish, and although they may not be primary etiological agents their presence can be an aggravating factor Monilia or yeasts may produce a clinical picture indistinguishable from tinea unguium, but more often the clinical appearances are fairly characteristic Opaque, white or yellowish areas are seen under the free edge or side of the nail, and thick collections of soft, cheesy material may often be scraped from beneath the nail plate, and the organisms seen in microscopic preparations are readily cultured. A non-purulent paronychia is frequently associated. In many cases the nail plate remains smooth, although discoloured, but in other cases, particularly when paronychia is marked, the nail plate may be dull, scaly irregular and may split into thin laminæ The treatment is similar to that of tinea unguium, but the subungual collections are best scraped away and spirit paint allowed to flow into the cavity The phenol-iodine paint is suitable or the following perchloride of mercury grs. 4 salicylic acid grs. 50 industrial methylated spirit to 1 oz.

New growths of the nail. *Paronychial warts* are quite common, and these occasionally grow under the *nail plate* from the side or from the free edge They show as dull yellow or brownish areas, which may be quite tender and their cap of soft keratin can be determined by means of a small scalpel or needle. The occurrence of other warts elsewhere assists in diagnosis Lesions should be curetted away or destroyed by diathermy or galvano-cautery

Subungual exostoses are relatively uncommon, and usually arise on the big toe As a rule, a smooth, very hard, rounded nodule arises under the distal half of the nail plate Through the nail plate it appears pink or waxy The nail plate is gradually pushed upward, and it is possible to insert a narrow bladed knife between the nail and the smooth dome-shaped surface of the exostoses. The cartilaginous or bony consistency of the nodule may be determined by inserting a sharp needle. The true origin of this lesion is uncertain, and although as a rule it would appear to arise from a cartilaginous rest a developmental abnormality affecting the

common lesion is hæmorrhage beneath the nail plate, i.e. the subungual hæmatoma. This condition usually follows a sharp blow upon the nail, causing intense pain, and a rapidly developing red spot is visible through the nail plate. In time, the red colour becomes dull purple and brown, and finally appears black. The discoloured spot grows forward with the nail plate, which suggests that the nail bed and nail plate grow forward together. When, after a time, the hæmatoma reaches the free edge, it may be scraped away as a dry chocolate-coloured powder.

Immediate application of cold and pressure will prevent or retard the development of subungual hæmatoma. When hæmorrhage is profuse, relief may be given by drilling the nail with antiseptic precautions to allow the blood to escape. This often relieves the excruciating pain. Drilling may be performed for cosmetic reasons in the later stages of hæmatoma, the blood pigment being scraped away and the cavity filled with calamine and sealed with varnish.

Ingrowing toenail (unguis incarnatus or onychocryptosis). This condition is usually the result of improper trimming, a sharp spicule of nail being left at the side of the nail plate and thus penetrating the lateral fold. Less often the condition is produced by the pressure of tightly fitting shoes, or is secondary to lateral paronychia. Infection, if not already present, is inevitable, and the inflammatory swelling increases the penetration of the nail plate and adds greatly to the patient's discomfort. Soft projections of granulation tissue may appear in the nail groove.

In early cases antiseptic foot baths, skilled trimming of the nail plate, cauterisation with phenol and temporary packing of the nail groove, will usually effect a cure, but in more severe cases surgical removal of half the nail plate may be necessary.

Hangnails or agnails. These may be a developmental anomaly, but are more common in those who handle irritating or caustic substances such as creosote, tar, lime and cement. The condition is seen as a firm horny splinter occupying a lateral fold and projecting so that it becomes a nuisance by catching in clothing, and when broken back causes pain and predisposes to infection. It may be simply dealt with by careful paring from the base towards the free edge, and then applying a little collodion or nail varnish.

Infections. The nail is often involved in whitlow, and subungual infection produces *acute onychia* (Gk. *onyx*, nail). The nail folds are very susceptible to infection if nature's seal, the eponychium, is broken. This may be the result of pushing back the cuticle, but it is also common in cooks and barmaids and others whose fingers are continually macerated. Occasionally the causative organisms are yeasts or fungi, but in these cases the nail plate is more involved, as will be described shortly.

Pus coccal infections are the usual cause of *paronychia*, which may be recognised as a red, tender thickening of the posterior or lateral nail folds. Phases of acute inflammation occur, during which pus exudes from beneath the thickened fold. Some deformity of the nail plate results and may be marked, but not infrequently a purulent reaction undermines the base of the nail, and the nail plate is eventually shed.

Treatment. After attention to the patient's general health, chronic paronychia requires a regular *régime* of local treatment. The fingers

Alteration in nail surface. The nail surface may be dull and lustreless or highly polished as seen in Hippocratic nails. In this condition the nail are enlarged and the convexity exaggerated, and the ends of the fingers clubbed. It is commonly seen in chronic diseases of the heart or lungs, in which blood pressure on the right side of the heart results in passive congestion of the extremities. In sharp contrast with this condition is *koilonychia*, in which the nails have a concave surface and in marked cases are aptly described as spoon shaped. As a rule the surface is smooth. Koilonychia may be symptomatic of severe microcytic anemia but the condition is sometimes a congenital anomaly and is also associated with syphilis, disorders of nutrition, a neurosis, or hyperkeratosis of the nail bed. Whitfield noted its occurrence after gastric and duodenal hemorrhage.

The most common abnormalities of the nail surface are small transverse or longitudinal ridges. The former termed Beau's lines usually



FIG. 376. Onychogryphosis. Male 49

affect all the nails, and indicate nutritional disturbances associated with nervous or symptomatic diseases. Longitudinal striation may be marked and lead to splitting at the nail edge. This condition termed *onychorrhexis* usually affects all nails and although seen in general diseases, it is more common in skin diseases affecting the digits, such as eczema, psoriasis and lichen planus. Small pit like depressions in the nail surface are almost pathognomonic of psoriasis but occasionally occur in other conditions.

Alteration in nail plate. The nail plate may be thicker and harder than normal and this condition is termed *pachyonychia*. The most characteristic variety is congenital and usually associated with tylosis. Simple hypertrophy of the nail plate is called *onychauxis* and when extreme result in a large twisted appendage resembling a ram's horn *onychogryphosis*. The condition may be congenital but is usually acquired and it would seem that trauma, infection and trophic disturbances are the

terminal phalanx it would appear that trauma or infection are causative factors in some cases

Treatment consists in complete removal of the tumour from its bony origin We have had successful results following vigorous curettage with a steel spoon, and subsequent irradiation with gamma rays from a radon seed

Granuloma pyogenicum has already been mentioned in connection with ingrowing nail it usually follows trauma and infection Other neoplasms may involve the nail bed or nail folds but they are very rare, and call for no special comment The malignant subungual melanoma has been mentioned elsewhere (p 693)

Nail dystrophies Under this heading is considered a group of abnormal conditions of the nails due to many diverse causes. In some cases the nail condition is obviously dependent upon local or general disease, while in other cases the etiology is obscure. The dystrophies may be manifest in alterations of colour structural defects of the surface nail shape, nail substance or nail bed or in separation of the nail from its bed

Leuconychia is perhaps the most common dystrophy White marks may be seen as small specks white streaks usually transverse or large patches affecting half or the whole of the nail plate these conditions being termed leuconychia punctata leuconychia striata and leuconychia totalis. The condition may be a congenital abnormality and leuconychia totalis almost invariably is, familial cases being known but acquired cases are common, their origin being ascribed to slight trauma resulting in separation of cellular laminæ permitting the presence of air in the nail substance. Doubt has been thrown upon this simple explanation by the discovery of histological changes and it is thought that the white spots can be accounted for by areas of imperfectly keratinised cells and the presence of nucleated cells containing numerous granules of kerato-hyalin These cellular defects probably represent the primary change, rendering the nail more susceptible to slight trauma, the changes themselves being due to toxic or nutritional factors White spots often become more numerous after severe illness, and leuconychia totalis may occur it has also been noted in alopecia areata, and presumably depends upon some nervous or endocrine disturbance

Pigmentation. Pigmentation of the nails is most commonly the result of staining through contact with chemicals, such as those used in photography the dyeing of fur and leather and the staining of wood, especially in French polishers Staining may also result from the use of drugs such as chrysarobin and resorcin or antiseptic lotions Drugs which cause pigmentation of the skin may also affect the nails for example slate blue colour has been seen in argyria, brown colour in chronic arsenical poisoning and purplish bands have been ascribed to phenolphthalein Longitudinal pigmented bands are frequent in dark-coloured races, and pigmentary nævi are occasionally seen in Europeans. Discoloration of the nail is also common in mycotic infections and in conditions where the nail is separated from the nail matrix The red, purple or black relics of subungual hæmatoma rarely cause difficulty in diagnosis In severe icterus the nails are usually bile-stained, and they are not infrequently involved in the extensive pigmentation of Addison's disease

Nail affections associated with cutaneous diseases.

(a) Eczema. In the acute forms the nails are thinned and atrophic, and in rare cases they may be shed. In the chronic cases the nails are cracked and fissured, the surface traversed by longitudinal or transverse furrows, and sometimes there are small punctate depressions and erosions. Eczematous nails require protection with soothing dressings, the lines of treatment prescribed for eczema elsewhere being followed.

(b) Psoriasis. The commonest condition of the nails in psoriasis is pitting, the minute pit-like depressions being arranged in a transverse line



FIG. 878. Psoriasis of nails in a patient suffering from osteo-arthritis.

if the affection is of short duration, but in chronic cases the whole nail may be covered with the indentations, so that it resembles the surface of a thimble (Fig. 878). In other cases the free edge of the nail is detached and a thick mass of horny scales forms under it. These conditions may coexist. In very severe cases of psoriasis the nails are much deformed presenting irregular ridges on a partly exposed nail bed (*vide* Fig. 113).

Psoriasis of the nails may be treated by the application of a 2 to 5 per cent. chrysarobin ointment, or by similar strengths of salicylic acid. Scraping of the surface before applying these is advisable. Ethereal lotions containing the same preparations have also been recommended, but X-rays (200 *r*) and general measures are of more value.

most important etiological factors and must be considered in treatment Removal of the larger nails is often indicated and excision cauterisation or irradiation of the nail bed may be necessary to prevent a recurrence (Fig 876)

Alteration in nail bed Atrophic changes in the nail bed usually result in a clean separation of the nail plate, shortly to be described. Subungual hyperkeratosis is simply an increase of the horny layer beneath the nail plate It is most marked in mycotic infections of the nail and in psoriatic nails but is often present in some degree in the other nail dystrophies Separation of the nail from its bed occurs in two forms. *Onycholysis* is the term applied to the separation at the free edge progressing backwards and it is better to reserve the term for those cases in which the nail bed is clean and smooth, excluding the variety due to

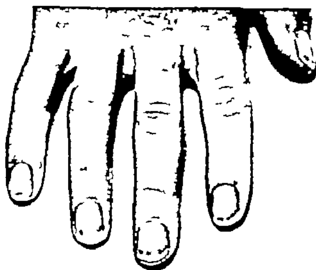


Fig 877 Subungual purpuric lesions. Trichiniasis. Subacute infectious endocarditis and scurvy (Dr E. Davis.)

mycotic infections and those due to local inflammation The term *onychomadesis* is used when separation begins at the nail root and progresses forward so that the nail is eventually shed. This may be a congenital abnormality and familial and hereditary cases have been reported. The condition occurs with epidermolysis bullosa, and like the preceding condition may be symptomatic and secondary to syphilis or to nervous disorders The term *onychoschizia* is sometimes applied to separation of the nail plate from its bed but is more appropriately used for the splitting of a nail into several laminae usually spreading back from the free edge This generally reflects a depression in the general health but is occasionally related to the use of nail varnish The vascularity of the nail bed permits the study of the capillaries therein with the aid of a suitable microscope and an estimate of their fragility may be made by observing the appearance of minute hæmorrhages when pressure to occlude the veins is applied to the limb Macroscopic subungual hæmorrhages are not uncommon in the purpuras (Fig 877)

guide to the physician. Chronic diseases may lead to atrophy of the nails, to fissuring and reeding, and to various deformities. Reeding and splitting are said to occur specially in the gouty but they are also simple senile changes.

Affections of the nails in nervous diseases. Injury to the nerves, neuritis, syringomyelia, Morvan's disease tabes, hemiplegia, and nerve leprosy (Fig 260) are accompanied by dystrophy of the nails. The ungual appendages may simply fall or become brittle or atrophy or they may separate from the nail bed. Painless recurrent whitlows are characteristic of Morvan's disease Sclerodermia, which is possibly a nervous disease leads sometimes to gradual atrophy of the nails, which in sclerodactyly are merely small horny plugs.

(*c*) Lichen planus In rare cases the nails are affected in severe lichen planus The condition is illustrated in Fig 70

(*d*) Pityriasis rubra pilaris. In this disease the nail is thickened and reeded and of a yellowish colour and there is some hyperkeratosis of the bed.

(*e*) In exfoliative dermatitis the nails may be completely or partially shed. This condition is illustrated in Fig 132

The bed of the nail may be left soft, or the nail may be detached in front or at the base

Similar conditions are seen in pemphigus, pemphigus foliaceus dermatitis herpetiformis, and in epidermolysis bullosa (Fig 11)

(*f*) In Darier s disease the nails are brittle and striated.

(*g*) Alopecia is sometimes accompanied by atrophic changes in the nail, characterised by white striæ and fissuring and complete leuconychia (rare) These changes are more common in the universal alopecias. The association of dystrophic nails with congenital alopecia is illustrated in Fig 23

(*h*) In adenoma sebaceum *pterygium* an exaggerated growth from the eponychium may extend over the nail plate (Fig 26)

(*i*) In X ray dermatitis the nails are gravely affected. They first become brittle and exfoliate, and ultimately atrophy In advanced cases the end of the finger is rough, irregular with narrow thickenings upon the site of the ungual plate There is often onychia and perionychia especially in the winter months The affection is exceedingly painful and rebellious to treatment (*vide* Fig 142)

We have seen part of the matrix destroyed as a result of radium therapy to a para ungual wart resulting in a divided nail plate (p 769).

Subungual keratoses sometimes occur in cases of radium dermatitis

Syphilis of the nails The primary chancre may appear about a nail It is not uncommon in medical men and midwives at the angle of the nail It may be a simple crack with some induration or a chronic ulcer or a large oval sore. An ungual chancre is painful and a chronic painful ulcer about the nail in a person exposed to infection should raise a suspicion and determine careful examination for the treponema pallidum

Onychia sicca syphilitica is a rare secondary condition characterised by a friable condition of the free border leading to splitting and linear pitting The whole nail may ultimately become opaque, yellow and like pith. In another type the distal ends become thickened, and sometimes the whole nail may be shed. The lesions are painless (*vide* Fig 288)

Perionychia syphilitica In this condition a scaly or warty papule appears under the fold of the nail and the area swells up and becomes red and inflamed From pressure of the edge of the nail the lesion may ulcerate but there is remarkably little pain The lesions are chronic and tend to recur They are treated by local applications of mercurials, black wash etc and by internal treatment on the usual lines (Fig 20?).

Nail conditions in general diseases, etc. The acute specific fevers and any pyrexial conditions such as pneumonia tonsillitis etc may cause changes in the nails. Grave injury operation and shock may also affect them. The local evidence is a transverse furrow on the nails due to a diminished activity of the matrix. The furrows (Beau s lines) grow forwards at the rate of one-eighth of an inch a month, and may be a useful

cent of sodium sulphate, sodium chloride magnesium sulphate or sodium thiosulphate may be used, and if not well tolerated the skin may respond to colloidal solutions prepared by adding bran, oatmeal, starch, or gelatin to the bath. When pruritus is a marked symptom the addition of 2 or 3 ozs. of liquor picis carbonis to the bath may be helpful, and proprietary preparations are available for medicating the bath with pine tar or sulphur. Permanganate baths are useful in weeping and infected dermatoses. Thermostatically controlled baths have been used in dermatology especially abroad, and the patients have been kept immersed for several weeks with good effect. However the technique is a troublesome one requiring much supervision and skilled nursing and few indications for its use have been found in this country.

Diet. Common sense and the established principles of medical practice are sufficient guides to dietetic measures. Sometimes in toxic eruptions of obscure origin it is wise to put the patient on a protein free diet for a week giving ample fruit and fresh vegetables. In exudative conditions a milk diet for the same period is often advantageous. In seborrhoeic conditions and also in furunculosis in obese subjects restriction of starch, sugar and fat is desirable.

Vitamin therapy has been practised indiscriminately and the results have been disappointing, but the principles and the indications have been pointed out in the chapter on vitamins and nutrition of the skin (p. 76).

Drugs. Many drugs have been used in dermatology but experience soon limits the number in routine practice.

Aperients are often helpful in acute conditions, and an alkaline saline mixture such as mist. alba together with small doses of calomel or hyd. cum cret. are of value in early treatment. Occasional purging with large doses, ½ to 1 oz. of sodium or magnesium sulphate may be excellent, especially in chronic eruptions, such as seborrhoeic dermatitis. On the other hand, many toxic eruptions may be aggravated by purging and milder laxatives are indicated. In the seborrhoeic state of senile subjects and in those who have irritable conditions of the skin, large doses of alkalies sufficient to produce strongly alkaline urine are often of value. Calcium or magnesium carbonate, sodium and calcium lactate and sodium citrate are suitable preparations, and if an absorbent is required magnesium trisilicate or kaolin may be used. Acids are sometimes indicated in rosacea and in some forms of glossitis and soreness of the tongue and in the flatulent type of dyspepsia associated with chronic dermatoses. Doses of 30 to 60 minims of the dilute acids should be given with meals.

Hypnotics and sedatives are very important in many diseases of the skin. If patients have irritable skin lesions which induce uncontrollable scratching it is obvious that local treatment alone cannot succeed. Simple bromide mixtures containing alkali and nux vomica are often indispensable, particularly in the dermatoses associated with mild neurosis and the menopause. Phenobarbitone in ½ to ½ grain doses two or three times a day is

APPENDIX I

PRINCIPLES OF GENERAL TREATMENT AND FORMULÆ

In the acute phase of many diseases rest in bed is of great value Apart from local infections the majority of skin diseases have a constitutional background demanding as much attention as that in other systemic diseases When possible, competent nursing should be obtained for the patient It is hoped that in the future many more nurses will specialise in dermatological nursing

We are of the opinion that the majority of patients suffering from skin diseases require treatment upon general lines and that this is often more important than local applications There is a growing tendency to regard the constitutional background as more significant in etiology than the pathogenic organisms to which many dermatoses are attributed *i.e.*, the soil is more important than the seed

General treatment concerns the management of the patient rest and exercise diet care of bowels and correction of associated ills It calls for consideration of familial and hereditary factors and of environmental influences in the home at school and at work The psychological and industrial medical aspects in this regard are of the greatest importance and it is vital that the physician should obtain the confidence of his patient and show a sympathetic understanding of his personal difficulties which may play a major part in a chronic dermatosis

We have been impressed by the results of treatment in rehabilitation centres of extensive and chronic dermatoses, both in military and in civil practice The physical exercises and occupational therapies are no doubt beneficial as distractions to the patient, diverting his interest from himself and his cutaneous affections The realisation that he is able to exercise and work the fact that he is doing it in company with others suffering from various disabilities and that his period of sickness is devoted to some purposeful employment are of inestimable therapeutic advantage to the individual

Internal measures of treatment have their place in this scheme and we append a list of prescriptions which we have found useful Distinction should be made between specific remedies required for the treatment of organic diseases and the correctives, tonics and sedatives employed in the treatment of functional disturbances. The latter may need to be long continued

Baths are very useful in dermatology and when the skin is unbroken the application of soap and water often relieves irritation, and in many patients the psychological effect of general cleanliness provides a useful stimulus to recovery When the skin surface is broken by infections, injuries, or the exudative process of eczema, isotonic saline is often essential or the skin cells are injured by osmotic action with a corresponding increase of erythema, exudation and aggravation of symptoms. *One per*

venient method to employ This consists in injecting 10 c.c. of blood conveniently taken from the median basilic vein and put into the gluteal muscles. The procedure may be repeated once or twice a week, and if any benefit is observed, six to twelve injections may be given in a series. Injections of 5 or 10 c.c. of stock human plasma, or serum taken and stored with the usual precautions and tests, produce slightly greater reaction but are perhaps more useful in chronic infections as compared with toxemias. In allergic subjects intramuscular injections of peptone are well tolerated and may do good. If a more stimulating effect is required a sterile preparation of milk such as Aolan may be given or some stock vaccine Finally intravenous injections of T.A B., in an initial dose of 100 million organisms, increasing as necessary to produce a sharp febrile reaction, may turn the scale of a chronic eruption such as psoriasis, eczema, or seborrhoeic dermatitis. Sometimes smaller doses of 10 million organisms once a week are valuable especially in psoriasis.

Injections of the heavy metals gold, arsenic bismuth, mercury and colloidal manganese are frequently of service in chronic infections and in some fixed eruptions which are presumably allergic reactions to cryptic infection, e.g., lupus erythematosus. Toxic reactions to these metals, especially to arsenic, gold and bismuth, are not uncommon, so the patients need treatment under close observation with occasional checks on the blood count and routine testing for albuminuria which is often the first indication of toxic effects upon the kidneys Apart from the serious consequence of renal damage itself the resulting inability to excrete a toxic drug may have grave consequences.

Endocrine therapy In addition to the recognised general and dermatological indications for endocrine therapy certain dermatoses occasionally respond favourably to careful treatment with pituitrin thyroid, adrenalin, insulin, and the oestrogenic hormones.

Pernicious and related ills some cases of acne and of psoriasis at puberty or menopause, some cases of xeroderma and other dermatoses may respond to thyroid.

The value of oestrogen over a varied field is only partially understood but it is sometimes effective in cases of acne or rosacea, sycosis and other seborrhoeic affections.

Insulin has been used with some success in treatment of cases of chronic furunculosis.

Mixtures

Mistura alkalina

Potassium bicarbonate	30 gr	2 grm
Potassium citrat	30 gr	2 grm
Calcium lactate	5 gr	0 3 grm.
Magnesium carbonate	5 gr	0 3 grm.
Syrup of orange	30 min.	2 ml.
Chloroform water	to 1 fl. oz.	30 ml.

For seborrhoeic dermatoses, senile prurigo acute psoriasis and toxic eruptions

a very useful drug and a larger dose at night will often prevent automatic scratching during light sleep This drug is usually adequate for mild insomnia but there are many barbiturate preparations which are more effective as pure hypnotics Some individuals do not respond to barbiturates and children and infants may be particularly resistant, and then *syrup of chloral* is a useful alternative In the severe prurigos full doses of *omnopon and scopolamine* may be given with advantage for about a week and, combined with suggestion may do a lot of good

Atropine. In conditions where irritability of the vegetative nervous system is suspected small doses of atropine may be given with the sedatives or tinct belladonnæ, 5 to 10 minims added to a bromide or alkaline mixture Some types of rosacea respond well to this drug, and a synergic combination of phenobarbitone, atropine and small doses of ergot is more effective than any of the three drugs given alone

Arsenic has perhaps too prominent a place in the therapy of skin diseases and if given over a prolonged period seems to give rise to multiple squamous-celled epitheliomata Its specific use in the treatment of syphilis and yaws has been discussed and its efficiency in psoriasis and *dermatitis herpetiformis* is unquestioned, although it cannot be said to be a cure for either disease Occasionally doses of a few minims of liquor arsenicalis added to a sedative mixture or to an iron tonic may be very helpful in chronic mild infections and in eczematous conditions. Its method of action is not understood, but it would appear that traces of the rare heavy metals have some influence upon metabolism and certain chronic diseases Something is to be said for using a less toxic metal such as bismuth, manganese antimony or mercury The latter with its mild aperient action and its effect upon the liver and an inhibitory effect upon the intestinal flora is often very useful in urticaria, eczema and may give a better therapeutic effect than arsenic in psoriasis

Sulphonamides. The indication for sulphonamides is the same in dermatology as in other infections but since the skin has in itself a powerful defence against infection excellent results have been obtained with relatively small doses It should be remembered that sulphonamides may sensitise the skin to light whether used internally or locally and we believe the drug should be used very cautiously in dermatology

Penicillin. Penicillin on the other hand, rarely appears to disturb the skin and when its indication has been determined bacteriologically it may be given in full doses in such infections as impetigo erysipelas erysipeloid carbuncle etc. It has proved very useful in infected eczema and resistant pyogenic intertrigo Its value in syphilis is established.

Protein shock Measures which may be described by this term are sometimes very useful in chronic skin diseases suspected to be of a toxic or allergic nature. It is not certain how the therapy works but no doubt non specific immune bodies are produced and the protective mechanism is stimulated. Autohæmotherapy is perhaps the safest and most con

Mistura salicini

Salicin	15 gr	1 grm.
Powdered tragacanth	q.s.	q.s.
Chloroform water	to 1 fl. oz	30 ml.

For toxic eruptions, acute psoriasis.

Mistura valerianae composita

Potassium bromide	10 gr	0 6 grm
Tincture of nux vomica	5 min.	0 3 ml
Ammoniated tincture of valerian	30 min	2 ml.
Chloroform water	to 1 fl. oz.	30 ml

For dermatological psychoses.

Mistura arsenicalis alkalina

Arsenical solution	4 min	0·24 ml.
Sodium bicarbonate	10 gr	0·6 grm.
Light magnesium carbonate	5 gr	0·3 grm.
Peppermint water	to 1 fl. oz.	30 ml

For psoriasis, dermatitis herpetiformis

Mistura ferri et magnesii sulphatum

Ferrous sulphate	3 gr	0·2 grm
Magnesium sulphate	20 gr	1·2 grm.
Dilute sulphuric acid	20 min	1·2 ml.
Peppermint water	to 1 fl. oz.	30 ml.

For pustular acne, furunculosis.

Mistura gentianæ acida

Dilute hydrochloric acid	*30 min*	*2 ml.*
Sodium sulphate	5 gr	0·3 grm.
Emulsion of chloroform	10 min	0·6 ml.
Compound infusion of gentian	to 1 fl. oz.	30 ml.

For rosacea, achlorhydria, glossitis

Mistura gentianæ alkalina

Potassium bicarbonate	15 gr	1 grm.
Infusion of gentian	to 1 fl. oz.	30 ml.
Tincture of nux vomica	5 min	
or tincture of belladonna	5 to 10	may be added

For rosacea, seborrhœic dermatitis, mild neurogenic dermatoses.

Mistura hydrargyri iodidi

Solution of mercuric chloride	60 min.	4 ml.
Potassium iodide	10 gr	0·6 grm.
Chloroform water	to 1 fl. oz.	30 ml

For tertiary syphilis, lichen planus, psoriasis in late life

Mistura hydrargyri perchloridi

Solution of mercuric chloride	60 min	4 ml
Dilute hydrochloric acid	*5 min.*	*0·3 ml*
Infusion of gentian	to 1 fl. oz.	30 ml

For toxic eruptions, lichen planus.

Mistura potassii bromidi composita

Potassium bromide	10 gr	0·6 grm.
Aromatic spirit of ammonia	*20 min*	1·2 ml.
Tincture of nux vomica	10 min	0·6 ml
Infusion of gentian	to 1 fl. oz.	30 ml.
To which may be added		
Solution of arsenic	5 min	0·3 ml
or tincture of belladonna	10 min	0·6 ml

For neurogenic dermatoses, menopausal and vasomotor disturbances.

Mistura quininæ et magnesii sulphatum

Quinine sulphate	2 gr	0·12 grm
Dilute sulphuric acid	5 min.	0·3 ml.
Magnesium sulphate	20 gr	1·2 grm
Syrup of lemon	30 min	2 ml
Chloroform water	to 1 fl. oz.	30 ml

For lupus erythematosus, pustular acne, rosacea, pityriasis rosea

Mistura rhei composita

Sodium bicarbonate	10 gr	0·6 grm.
Syrup of rhubarb	60 min	4 ml.
Syrup of orange	60 min	4 ml
Chloroform water	to 1 fl. oz.	30 ml.

For papular urticaria in children (2–4 drachms) ; toxic rashes

Creams. Creams used to consist of equal parts of a simple vegetable oil and lime water to which zinc oxide or calamine was added, and small percentages of tar solution or ichthyol were often incorporated as sedative or antipruritic agents. The modern emulsifying bases provide us with much more elegant creams and the objectionable greasiness of the old preparations is eliminated. The emulsifying bases, which are also used in modern ointments, permit a more intimate contact of the contained medicaments with the epidermal cells and a greater penetration into the follicular orifices. Creams are obviously indicated when lotions prove to be too drying or are not well tolerated by delicate surfaces.

Pastes are in some respects equivalent to creams because the true paste, dermatologically speaking, contains as much solid as grease and the high percentage of powder allows a certain amount of absorption and evaporation. A paste is not so heating as an ointment. Pastes are therefore most suitable for irritable conditions of the skin, particularly about flexures where the retention of moisture under an ointment is apt to lead to sepsis. The classical paste in common use is pasta zinci consisting of 25 per cent. zinc oxide 25 per cent. starch in fine powder and 50 per cent. soft paraffin. This is often medicated with 8 per cent. of crude tar for eczema, with 8 per cent. of yellow oxide of mercury for infective lesions and with 0.5 per cent. dithranol for psoriasis or tinea cruris. Two per cent. of salicylic acid in zinc paste constitutes Lassar's paste and the salicylic acid, being keratolytic, softens scaly lesions and often diminishes irritation. Five to ten per cent. of various sulphonamides are often incorporated in paste, but the sensitising effect of sulphonamides upon the skin should not be overlooked, and we rarely advise their use.

Ointments. Ointments containing a high percentage of greasy base are chiefly used in the very dry scaly lesions of the skin, of which psoriasis is the best example. They are also useful for softening the hard crusts which may form on the scalp in impetigo, and if the scalp is very greasy ointments convey medicaments more effectively to the skin beneath the greasy film. The modern tendency is to use emulsifying bases, and the more efficient penetration obtained permits a lower percentage of the various medicaments to be employed. These bases have the great advantage of being readily removed, sometimes by water alone.

The Uses and Properties of Ointments and their Bases

Ointments may be used for three purposes :—

(1) As a protection to the skin surface when it is excessively dry or tends to crack and when the protective horny layer has been exfoliated by exudate, e.g., after a blister has burst.

(2) As an emollient or softener of the skin when it is desirable to replace the natural oils and fats of the skin.

(3) As a vehicle for conveying some medicament effectively to the surface or capable of penetrating the epidermis and its follicles. These properties are required in the treatment of infections of various types and

APPENDIX II

PRINCIPLES OF LOCAL TREATMENT AND FORMULÆ

The choice of local applications is determined by the local condition. In the first place, if the skin surface is broken, isotonic solutions are essential or the erythema and exudative process are increased with a corresponding aggravation of symptoms. Scabs and crusts may be softened by isotonic saline compresses or by simple kaolin poultices or by the old-fashioned starch poultice. This is applied warm or cold for short periods since the continuous use of most dressings increases the risk of secondary infection and delays the formation of the natural horny layer. As a rule, exposure of the skin surface to the open air and sometimes to sunlight, is a useful procedure. The chief contra-indication is inherited or acquired light sensitivity.

Lotions are the most useful applications to the skin, and this accounts for the popularity of the simple calamine lotion. This and many lotions and creams contain lime water or are essentially alkaline in reaction. It is well to remember that the normal pH of the skin is about 5·5 and that sometimes it is better to use lotions which are acid in reaction and which therefore support the so-called "acid mantle" of the skin. This may be an important factor in resistance to bacterial and mycotic infections. Solutions of tannic or boric acid are very useful in certain irritable conditions of the skin, and some encouraging results have been reported following the use of buffered solutions of the correct hydrogen-ion concentration. When an antiseptic effect is desired 3 per cent. of phenol or 1 : 1,000 mercury perchloride or 1 per cent. hydrarg. ammon. may be added to calamine lotion.

Freshly prepared acriflavine or proflavine 1 : 1,000 is a useful antiseptic and rarely irritates the skin. Weak solutions of the dyes are popular and if a somewhat astringent preparation is required l'eau d'Alibour may be used.

Paints. The name is usually reserved for very rapidly drying applications to the skin. One per cent. solutions of the dyes in 50 per cent. spirit or various strengths of silver nitrate in a watery or spirituous solution are common examples. Quickly drying solvents such as alcohol, ether or acetone are generally employed. Penicillin is valuable as a spray containing about 500 units per cubic centimetre.

Powders. Powders may often replace lotions as a convenient method of drying the skin and weeping lesions. The usual basis is zinc oxide or talc and percentages of calomel, bismuth subgallate, boric acid, salicylic acid, or sulphur are added for various purposes. Many of the proprietary preparations are more elegant than the official powders and a wide range is available.

Creams. Creams used to consist of equal parts of a simple vegetable oil and lime water to which zinc oxide or calamine was added, and small percentages of tar solution or ichthyol were often incorporated as sedative or antipruritic agents. The modern emulsifying bases provide us with much more elegant creams and the objectionable greasiness of the old preparations is eliminated. The emulsifying bases, which are also used in modern ointments, permit a more intimate contact of the contained medicaments with the epidermal cells and a greater penetration into the follicular orifices. Creams are obviously indicated when lotions prove to be too drying or are not well tolerated by delicate surfaces.

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(2) As an emollient or softener of the skin when it is desirable to replace the natural oils and fats of the skin

(3) As a vehicle for conveying some medicament effectively to the surface or capable of penetrating the epidermis and its follicles These properties are required in the treatment of infections of various types and

also when attempts are being made to influence the deeper layers of the epidermis and the dermis

The types of base required for these purposes vary accordingly —

(1) *For mechanical protection the paraffins* are obviously indicated. These mineral hydrocarbons of the methane or paraffin series are bland inert substances which cannot be saponified or hydrolysed and utilised in metabolism and they have no appreciable power of penetration They are not miscible with water or exudate and they impede the action, *bacteriologically and chemically of any incorporated medicaments*, which is not necessarily a disadvantage if the fact is recognised. On this account the percentages of antiseptics and fungicides are higher in paraffin bases than in the penetrating types

(2) The vegetable and animal oils and fats while affording some protection to the skin surface are more penetrating and to some extent can be absorbed and metabolised They have more softening or emollient properties and the contained medicaments reach deeper layers of the skin and are more active than in paraffin bases

Goose grease lard and lanolin mixed with oils or glycerine are the most readily absorbed by the skin

(3) Lanolin which contains cholesterol is an example also of the third type of base having considerable powers of penetration and the property of *being readily miscible* with water *owing to the emulsifying properties* of the cholesterol fraction Many new emulsifying bases have now been introduced and their applications in dermatology have been studied by Silcock, Mumford Bamber and others

An emulsion is a suspension of globules of one liquid (dispersed phase) in another liquid forming the continuous phase and the emulsion is stabilised by an emulsifying agent which acts either by reducing interfacial tension or by preventing coalescence of the globules comprising the dispersed phase *The continuous phase may be oil or water and thus we* have water in oil (W/O) or oil in water (O/W) emulsions

The new hydrous ointment of wool alcohols B P (containing 50 per cent of water) although introduced during the last war to economise with paraffins and fats is a good example of a water in oil emulsion.

Its advantages are that it neither dehydrates nor degreases the skin that as its continuous phase is oil the base mixes readily with the normal fats of the skin that it is able to penetrate the follicles and is especially valuable *as the vehicle for fat soluble medicaments such as* benzoic and salicylic acids the metallic oleates, tar etc. that it is stable under ordinary conditions and only loses water slowly from the emulsion

Its disadvantages are that it is not so readily removed by *washing nor* is it so readily miscible with sweat or exudate as the O/W bases

In such conditions an oil in water base as advocated by Mumford is more valuable especially when the contained medicaments are water soluble

The creams made with lime water and the vegetable oils are O/W emulsions of simple type better emulsions can be made with glyceryl monostearate or with triethanolamine oleate or stearate and soft paraffin and water

The most popular emulsifying agent of this O/W type in present use is

lanette wax S.X., which is a mixture of hexadecyl and octadecyl alcohols with 10 per cent. of their esters. The sulphonated and phosphated esters of other higher fatty alcohols are also much used as emulsifiers and an official O/W base containing cetostearyl alcohol and sodium lauryl sulphate will be introduced to meet dermatological needs.

Halden's emulsifying base (Ung. H.E.B.) according to Mumford fulfils most of the desiderata of an ideal ointment base of the O/W type and we have found it valuable in the treatment of moist and exuding lesions. Its ease of removal with water alone and its lack of greasiness make it especially suitable for the scalp. The addition of 25 per cent. of Ung. H.E.B. to an ointment made with a simple or paraffin base increases the action of contained medicaments and facilitates the removal of the ointment from the skin.

Methyl cellulose is a useful alternative agent for preparing an O/W emulsion, *e.g.* see cremor picis carbonis. The colloidal suspension thus prepared prevents the coalescence of the oily globules comprising the dispersed phase.

Liniments. Liniments are usually designed to be rubbed into the skin as rubefacients, as in the treatment of alopecia, but the term is also applied to oily and spirituous lotions for use on the skin. In xeroderma a combination of liquid paraffin and a vegetable oil is particularly useful to soften the skin, because the mineral oil is not absorbed and therefore gives a more permanent effect, until removed by soap and water. Glycerin is a hygroscopic substance and may be used for dry lesions of the skin, and drugs such as lead subacetate, or strong concentrations of phenol may be incorporated in pure glycerin with good effect.

Plasters, as the name suggests, are adhesive preparations usually containing a strong medicament such as salicylic acid, creosote, phenol or mercury, for use when a prolonged caustic or counter irritant effect is required. Lupus and warts are occasionally treated by such a method. Simple non-medicated plasters of the elastic type are extremely useful as occlusive dressings or where pressure and protection are required, as in varicose lesions.

Varnishes are not used so commonly, and flexible collodion serves most purposes. However, some of the synthetic resins are being adapted for dermatological use, and combined with tar or ichthyol, etc., they may become popular again. Unfortunately some of the solvents used are irritating to the skin, and evaporation is rarely complete because these solvents are readily absorbed by lipoids in the skin, and their irritant effects are therefore protracted.

Soaps. Bland soaps are well tolerated by the skin as a rule, but if it is exceedingly dry a basic superfatted soap is preferable. Treatment with medicated soaps is disappointing, and somewhat uncertain, because the degree of dilution is incalculable. Soaps containing phenol or mercury may be used for irritable or infected conditions of the skin and may prevent the extension of follicular infection in sycosis barbæ, as a result of shaving

Sulphur resorcin or ichthyol soaps may contribute to the local treatment of acne and seborrhoeic conditions. Spirit soap alone or medicated by the addition of 10 per cent. of sulphur or of liquor picis carb. is useful as a shampoo in dandruff but in eczematous conditions of the scalp the spirituous solutions may increase weeping. The soapless shampoos are more efficient at removing grease from the scalp, but are not always tolerated and may produce dermatitis or eczema. They are unsuitable for a dry skin.

FORMULÆ FOR LOCAL THERAPY

Creams

Cremor zinci

Zinc oxide	12
Hydrous lanolin	12
Olive oil	36
Lime water	to 100

Emollient protective for eczema, dermatitis.

Cremor penicillini

Penicillin	200–500 units per grm
Liquid paraffin	10
Lanette wax S.X	20
Water	to 100

For pus-coccal infections.

Cremor ichthammolis

Ichthammol	2
Zinc cream	to *100*

Emollient.

Cremor calaminæ

Calamine	8
Lanolin	2
Sesame oil, or olive or arachi oil	45
Lime water	45

Emollient cream and bland base.

Add Solution of coal tar 8 per cent. or phenol 3 per cent. for pruritus, lichen simplex.
Precipitated sulphur or ichthammol 2 per cent. for seborrhoeic dermatitis.
Strong solution of lead subacetate 2 per cent. for eczema and dermatitis.
Gentian violet 1 to 2 per cent. for seborrhoeic dermatitis and sycosis.

Cremor picis carbonis

Solution of coal tar	3
Liquid paraffin	10
Methyl cellulose	1 25
Water	to 100

For eczema; an oil in water emulsion.

Cremor paraffini

Liquid paraffin	10
Lanette wax S.X	–
Water	to 100

Emollient cream for xeroderma, exfoliative dermatitis.

Emulsions

Emulsio benzyli benzoati

Benzyl benzoate	25
Lanette wax S.X.	2
Water	to 100

For scabies.

Liniments

Linimentum acidi salicylici

Salicylic acid	3
Industrial methylated spirit	12
Castor oil	to 100

To which may be added 0·2 per cent. of mercuric chloride
or 12 per cent. solution of coal tar
Increase the proportion of spirit to reduce the greasiness.
For pityriasis capitis, psoriasis.

Linimentum calaminae

Calamine	8
Olive oil	50
Lime water	to 100

Emollient.

Linimentum cadini

Oil of cadi	12
Arachis oil	to 100

For pityriasis capitis and psoriasis.

Lotions

Lotio acidi tannici

Tannic acid	10
Industrial methylated spirit	20
Water	to 100

Protective against actinic light; hardens the skin.

Lotio calaminae

Calamine	6
Zinc oxide	4
Glycerine	6
Lime water	to 100

To this may be added 2 per cent. of phenol or solution of coal tar or precipitated sulphur; 1 per cent. of strong solution of lead subacetate; or 0·1 per cent. of mercuric perchloride

A cooling lotion and the most generally useful.

Modified as suggested for acne, impetigo eczema, seborrhoeic dermatitis, rosacea, intertrigo and dermatitis of any type excepting those due to alkalies.

Lotio cupri et zinci sulphatum (Eau d'Alibour)

Copper sulphate	0·5
Zinc sulphate	1·0
Camphor water	to 100

Antiseptic; astringent for impetigo intertrigo

Lotio cantharidini acida

Solution of cantharides	6
Acetic acid	6
Mercuric chloride	0 1
Industrial methylated spirit	25
Camphor water	to 100

For alopecia with dandruff.

Lotio cantharidini alkalina

Solution of cantharides	6
Solution of ammonia	6
Industrial methylated spirit	25
Camphor water	to 100

For alopecia areata

Lotio glycerini plumbi subacetatis

Glycerine of lead subacetate	6
Glycerine	6
Water	to 100

A cooling lotion

Lotio hydrargyri et resorcini

Mercuric chloride	0 1
Resorcin	2
Salicylic acid	1
Industrial methylated spirit	50
Camphor water	to 100

For pityriasis capitis and seborrhoeic dermatitis

Lotio picis carbonis

Solution of coal tar	[illegible]
Sodium bicarbonate	1
Water	to 100

2 per cent of strong solution of lead subacetate may be added. For pruritus and eczema

Lotio picis carbonis et acidi tannici

Solution of coal tar	3
Tannic acid	4
Water	to 100

For weeping eczema pompholyx.

Paints

Pigmentum acidi benzoici et salicylici

Benzoic acid	4
Salicylic acid	3
Acetone	25
Industrial methylated spirit	to 100

For chronic ringworm infections.

Pigmentum acidi salicylici

Salicylic acid	10
Ether	10
Flexile collodion	to 100

For warts, callosities

Pigmentum argenti nitratis

Silver nitrate	2 to 5
Distilled water	to 100

For intertrigo pruritus ani septic fissures

Pigmentum carbol fuchsini

Basic fuchsin	5
Phenol	15
Resorcin	25
Industrial methylated spirit	50
Water	to 100

For mycotic infections

The addition of 1 per cent of boric acid and 5 per cent. acetone makes this equivalent to Castellani's paint

Pigmentum hydrargyri perchloridi et acidi salicylici

Mercuric chloride	1
Salicylic acid	12
Industrial methylated spirit	to 100

10 per cent. of phenol may be added.
For seborrhoic and common warts, psoriasis, ringworm of nails.

Pigmentum picis carbonis

Crude coal tar	10
Benzole	20
Acetone	to 100

For psoriasis, lichen simplex, pruritus.

Pigmentum viride

Malachite green	1
Mercuric chloride	1
Industrial methylated spirit	80
Water	to 100

Antiseptic fungicidal.

Pastes

Pasta zinci et gelatini (Unna's paste)

Zinc oxide	15
Gelatin	15
Glycerine	25
Water	to 100

Protective and emollient used with supporting bandages for varicose conditions.

Pasta zinci oxidi composita B.P

Zinc oxide	25
Starch or talc	25
White soft paraffin	50

A bland base and protective
This paste may be softened by admixture with soft paraffin.

Pasta zinci oxidi cum acido salicylico B.P (Lassar's paste)
Zinc paste containing 2 per cent. of salicylic acid.
For scaly eczema, 2 per cent. of ammoniated mercury is added for impetigo
0 5 per cent. of dithranol is added for psoriasis and tinea cruris.

Pasta hydrargyri oxidi flavi
Zinc paste containing 2 per cent. of yellow oxide of mercury
For pus-coccal lesions, infected dry eczema and lichen.

Pasta picis carbonis
Zinc paste containing 2 per cent. of crude coal tar
For flexural eczema and lichen simplex.

Pasta picis mitis

Solution of coal tar	8
Boric acid	5
Zinc paste	to 100

A milder application for eczema, dermatitis.

Pasta resorcinolis

Resorcin	2, 6, or 12
Sulphur	2, 6, or 12
Soft paraffin	50
Zinc oxide	to 100

For acne vulgaris, plane warts.

Lotio cantharidini alkalina
Solution of cantharides 6
Solution of ammonia 6
Industrial methylated spirit 25
Camphor water to 100
For alopecia areata

Lotio glycerini plumbi subacetatis
Glycerine of lead subacetate 5
Glycerine 5
Water to 100
A cooling lotion

Lotio hydrargyri et resorcini
Mercuric chloride 0·1
Resorcin 2
Salicylic acid 1
Industrial methylated spirit 50
Camphor water to 100
For pityriasis capitis and seborrhoeic dermatitis.

Lotio picis carbonis
Solution of coal tar 2
Sodium bicarbonate 1
Water to 100

5 per cent. of strong solution of lead subacetate may be added. For pruritus and eczema

Lotio picis carbonis et acidi tannici
Solution of coal tar 5
Tannic acid 4
Water to 100
For weeping eczema, pompholyx.

Paints

Pigmentum acidi benzoici et salicylici
Benzoic acid 4
Salicylic acid 3
Acetone 25
Industrial methylated spirit to 100
For chronic ringworm infections

Pigmentum acidi salicylici
Salicylic acid 10
Ether 10
Flexile collodion to 100
For warts, callosities

Pigmentum argenti nitratis
Silver nitrate 2 to 5
Distilled water to 100
For intertrigo, pruritus ani, septic fissures.

Pigmentum carbol fuchsini
Basic fuchsin 5
Phenol 15
Resorcin 25
Industrial methylated spirit 50
Water to 100
For mycotic infection

The addition of 1 per cent. of boric acid and 5 per cent. acetone makes this equivalent to Castellani's paint.

Unguentum alcoholium lanae, B.P

Wool alcohols	6
Hard paraffin	24
Soft paraffin	10
Liquid paraffin	60

This is an emulsifying base of the water in oil type and is converted into ung aquosum (hydrous ointment) by incorporating 50 per cent. of water

Unguentum acidi borici et eucalypti

Eucalyptus oil	2
Boric acid ointment B.P (1 per cent. boric acid)	to 100

For infected and painful sores, ulcerated chilblains, pemphigus vulgaris. Cod-liver oil, 5 parts may be added.

Unguentum acidi salicylici B.P

Contains salicylic acid 2 per cent. in the ointment of the wool alcohols.

For pityriasis, cracked skin pruritus

Unguentum acidi salicylici et hydrargyri ammoniati

Salicylic acid	2
White precipitate ointment, B.P	to 100

For psoriasis, pityriasis, tinea.

Unguentum acidi salicylici et sulphuris

Salicylic acid	2
Precipitated sulphur	2
Emulsifying base	to 100

For pityriasis capitis, seborrhoeides.

Unguentum balsami peruviani

Balsam of Peru	10
Emulsifying base	5
Soft paraffin	to 100

For scabies, chronic ulcers and fissures.

Unguentum chrysarobini, B.P

Contains chrysarobin 4 per cent. in simple ointment.

To this may be added 2 per cent. of ammoniated mercury and 6 per cent of solution of coal tar

For psoriasis, resistant ringworm infections.

Unguentum cocois compositum

Solution of coal tar	12
Precipitated sulphur	2
Salicylic acid	2
Emulsifying base	5
Coconut oil	to 100

For pityriasis capitis, scaly seborrhoeides, psoriasis.

Unguentum dithranolis, B.P is preferred to ung chrysarobini.

Unguentum hydrargyri ammoniati, B.P (White precipitate ointment)

Contains 2.5 per cent. of ammoniated mercury in simple ointment.

For dry crusted or ulcerative impetigo tinea, acne necrotica.

5 per cent. tar solution and 2 per cent. salicylic acid is added for psoriasis.

Unguentum hydrargyri ammoniati aquosum, B.P

Contains 1 per cent. of ammoniated mercury in hydrous ointment.

For infected eczema and dermatitis tinea versicolor

Unguentum hydrargyri oleati, B.P

Contains 25 per cent. of oleated mercury in hydrous ointment.

For ringworm of skin and scalp.

Plasters

Emplastrum acidi pyrogallici	
Pyrogallic acid	40 per cent
Emplastrum acidi salicylici	
Salicylic acid	10 to 50 per cent
Emplastrum creosoti	
Creosote	10 to 30 per cent
Emplastrum creosoti et acidi salicylici	
Creosote	10 to 30 per cent
Salicylic acid	10 to 30 per cent

The plasters are prepared with the official bases or with proprietary adhesive plasters.

They are indicated for their caustic and keratolytic properties, *e.g.*, warts, corns, callosities, lupus nodules.

Poultice

Cataplasma amyli	
Boric acid	0·6
Powdered starch	5
Cold water	10
Boiling water	to 100

Rub the starch and boric powder to a paste with cold water, add the boiling water, stirring until the whole forms a jelly. Spread ¼ in thick on linen and apply cool for three to four hours.

To soften crusts.

Powders

Pulvis acidi salicylici compositus	
Salicylic acid	2
Zinc oxide	48
Talc	50

For intertrigo, hyperidrosis.

Pulvis sodii hexametaphosphatis compositus	
Sodium hexametaphosphate	5
Salicylic acid	2
Boric acid	5
Zinc oxide	40
Talc	to 100

For hyperidrosis, epidermophytosis of toe clefts.

Pulvis hydrargyri subchloridi compositus	
Mercurous chloride	10
Zinc oxide	40
Talc	to 100

For moist septic lesions, intertrigo, pruritus ani.

This powder may be diluted with an equal part of bismuth sub-gallate to increase its astringent properties.

Ointments

Unguentum acidi benzoici compositum B P C

(Whitfield's ointment). Contains benzoic acid 5 per cent, and salicylic acid 3 per cent, in white soft paraffin and coconut oil.

For ringworm infections.

APPENDIX III

PRINCIPLES OF PHYSIOTHERAPY

Galvano-cautery The usual cautery handle is shown, D (Fig 379) with Brain's model (E), which resembles a chromium plated pencil having a protective cap to prevent damage to the delicate platinum point when not in use It is advantageous to have a switch in the leads about 2 ft. from the instrument and then the current may be controlled by the left hand, leaving the right hand quite free for delicate operations. With this arrangement the cold point may be placed accurately upon a small stellate naevus on a child's face and then the current is switched on and when there is a reaction to the pain of the burn the naevus is usually destroyed. Unless a child is under an anaesthetic it is often impossible to approach a facial lesion with a glowing hot point, and it should be remembered that inflammable anaesthetics should never be used in association with the thermo-cautery and diathermy

The current required for galvano-cautery varies according to the thickness of the platinum point, but for dermatological use a current of 5 to 10 ampères is adequate, and to obtain this current 8 to 6 volts are usually required. A resistance of heavy wire is necessary to control a current of 5 to 10 ampères without overheating Two or three accumulators in series, or a mains transformer with an output as indicated, will operate the galvano-cautery There is no danger to the patient from electric shocks when using the galvano-cautery (Fig 379A)

The galvano-cautery with a fine point is a very useful instrument for the destruction of spider naevi telangiectatic vessels, warts and small neoplasms. Small pedunculated growths may be excised cleanly and without bleeding by the red hot point. When treating telangiectatic vessels in naevi or in rosacea the cautery points should be scarcely red, or bleeding is often troublesome Applications of the hot point along the line of a capillary vessel will often destroy it. Occasionally minute atrophic spots mark the points of application permanently Pustular acne lesions and molluscum contagiosum will often respond to the penetrating insertion of the red hot point into the centres of the lesions. A solitary wart may be destroyed completely by multiple puncture with the galvano-cautery but if many lesions are present the method is too painful and it sometimes suffices if the centre of each wart is punctured as deeply as possible and then the area of skin affected by the warts may be exposed to X-rays 400 r., once only The previous application of the cautery produces a more intense focal reaction with a safe dose of X-rays and satisfactory results have been obtained, especially with multiple warts on the beard area and neck. These suggestions indicate some of the applications of this very useful dermatological instrument.

Diathermy is also very valuable in dermatology A machine (Fig 379B) which gives a cutting effect with a point (F) is most useful for it may be used for the excision of pedunculated tumours With less current,

Unguentum hydrargyri perchloridi compositum

Mercuric chloride	0.5
Phenol	4
Glycerine	2
Arachis oil	10
Zinc ointment	to 100

For lichen planus, infected lichen simplex.

Unguentum hydrargyri subchloridi B.P.

Contains 20 per cent. of calomel in hydrous ointment.

For psoriasis capitis, pruritus ani and as a prophylactic in syphilis.

N.B. Metchnikoff's prophylactic ointment had 33 per cent. calomel.

Unguentum hydrargyri sulphidi rubri

Red sulphide of mercury	1
Precipitated sulphur	3
Ointment of wool alcohols	to 100

For resistant pityriasis capitis.

Unguentum iodi denigrescens B.P.C.

Contains 5 per cent. iodine with arachis oil and yellow soft paraffin.

For ringworm, chilblains, erythema induratum.

Unguentum olei cadini

Oil of cade	10
Ointment of wool alcohol	to 100

For psoriasis of scalp.

Unguentum olei morrhuæ compositum

Cod-liver oil	25
Eucalyptus oil	3
Boric ointment	to 100

For indolent ulcers.

Unguentum phenolis B.P.

Contains 3 per cent. of phenol in white beeswax, lard and hard and soft paraffins.

For itching dermatoses.

Unguentum gentianæ violetæ

Gentian violet	0.5
Salicylic acid	1
Emulsifying base	25
Coconut oil	25
Soft paraffin	to 100

For seborrhœic dermatitis, impetigo capitis, sycosis barbæ.

Unguentum sulphuris B.P.

Contains sublimed sulphur 10 per cent. in hydrous ointment.

For scabies.

For seborrhœic dermatitis this ointment may be diluted with three parts of zinc ointment.

Marcussen's ointment

Sublimed sulphur 1 kgrm. dissolved at gentle heat in 2 kgrm. of 50 per cent. potass. hydroxide. 375 grm. of this are added to a mixture of 25 grm. vaseline and 225 grm. anhydrous lanolin. Fresh zinc hydroxide (28 grm. $ZnSO_4$ and 40 grm. 20 per cent. NaOH) is mixed with the above and liquid paraffin is added up to 1,000 grm. 5 grm. benzaldehyde is added to control the odour.

a roll of felt or a porous receptacle is firmly compressed in suitable moulds to form pencils. The "Sparklet" model is a very convenient apparatus for the production of small pencils. A pencil may be melted against a hot tap or pared with a pocket knife to the exact size of the lesion to be treated. It is important that the sides of the pencil are parallel, otherwise as the snow melts in contact with the skin a larger area than is necessary is frozen. For a superficial lesion, such as a capillary nævus or strawberry mark firm pressure for twenty seconds will usually produce an inflammatory reaction with slight blistering, but the reaction of the skin varies considerably in different sites and in different individuals and it may be necessary to increase the time of the application to one minute When treating a wart the pencil (exactly the size of the wart) should be firmly applied until the whole wart and 1 mm. of surrounding skin is white, hard and frozen the usual period of application varying from one to three minutes. As a result of this treatment the wart becomes lifted up by a deep bullous reaction and in a day or so the lesion may be painlessly dissected out by snipping around its edge. Only the most superficial of rodent ulcers should be treated by freezing, and then a pencil of snow a little larger than the lesion should be firmly applied for at least two minutes The ulcerative reactions to severe freezing require dressing with simple ointments For large irregular areas, such as extensive capillary and macular pigmented nævi it is often advantageous to apply a slush made by adding small quantities of acetone alcohol or ether to the powdered snow The resulting mixture may be painted on the skin with a camel-hair brush, when instant freezing occurs. Increasingly severe reactions may be secured by keeping the skin frozen with repeated paintings The amount of scar naturally varies with the severity of the reaction produced, but, as a rule, the resulting scar is soft, pliable, and relatively inconspicuous.

It is important to realise that the freezing and the thawing processes which occur with CO_2 snow therapy are the most painful and in the frozen state the discomfort is slight. Therefore there is much to be said for giving adequate applications of carbon dioxide snow and the method sometimes adopted of applying a pencil of snow for five to ten seconds to a capillary nævus every month is undesirable. With this technique the maximum pain is inflicted with the minimum permanent effect and the psychological trauma of repeated treatments on little children is thoroughly bad. If a capillary nævus is going to react to freezing a satisfactory result should be achieved with one two or not more than three applications, and the intervals between treatments should be at least two months so that all traces of the inflammatory reaction will have disappeared before the next treatment is given

Electrolysis and ionisation. For these procedures a direct current is required. In *electrolysis* the patient puts one hand in a bowl of saline in which there is an electrode connected to the positive pole of the battery and the negative pole is connected to a holder provided with a very fine platinum-iridium needle preferably although a fine steel needle is satisfactory The latter however must only be used as a cathode because if connected to the positive electrode iron will be deposited in the skin and leave some discoloration. A current of 1-2 milliampères is required for electrolysis

producing a small spark when the needle touches the skin, warts molluscum contagiosum, and small infected granulomata and minute recurrences of rodent ulcer in areas previously treated by irradiation may be dealt with. A still smaller current used with a very fine needle, provides a quicker method of permanent epilation than electrolysis and the cosmetic result is satisfactory Larger lesions such as fleshy moles and large warts may be destroyed by multiple puncture and fulguration or by coagulating them under the firm pressure of a ball point or flat electrode. With a little experience, good cosmetic results may be obtained quickly by this method. A large indifferent electrode has to be used in connection with the diathermy point, but for the small operations in dermatology it is usually adequate for the patient to hold a metal hand electrode or put a moist hand upon a naked metal plate electrode With an electrode covered with

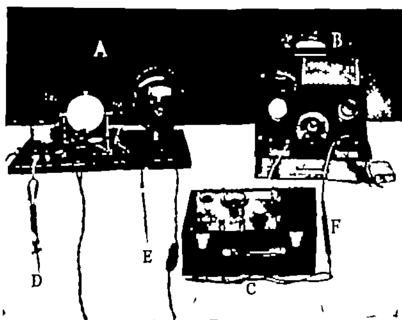


Fig 379
A Galvano-cautery B Diathermy C Galvanic battery

moistened lint it is possible to obtain a burn if any metal part touches the skin, so that a naked electrode is preferable for small currents. The caution about the use of inflammable anaesthetics is here repeated.

Medical diathermy is not much used in dermatology but as a means of inducing hyperaemia and of applying a dry heat to the skin it has its place in the treatment of early carbuncles and boils and for chronic perniosis and early Bazin's disease Short wave diathermy presents a more convenient method of application to the skin without surface contact and is deserving of a bigger place in dermatology

Cold. Pusey in 1905 introduced the method of freezing skin with carbon dioxide snow and by this means birthmarks and many superficial lesions of the skin are successfully treated The powdered snow which has a melting point of minus 70 C is produced by discharging the compressed gas through a fine nozzle and, after being collected in a fabric bag

the method useful in the treatment of multiple warts on the extremities It was found advantageous to paint the warts first with 10 per cent caustic soda solution and then to insert the hands or feet into vessels containing 1 per cent. of magnesium sulphate or 1 per cent. of sodium salicylate In the former case of ionisation with magnesium the positive electrode is placed in the solution and in the case of sodium salicylate, the negative The other limb may rest in normal saline connected to the opposite pole of the galvanic battery The resistance of the patient will of course, vary with the area of skin conducting the current and with its properties. Soft sweaty skins are good conductors, dry horny skins are bad conductors of current. If the hands are being treated between saline electrodes of this type the resistance of the body is about 6–8,000 ohms, so that 7–15 volts are required to give a current of 5–10 milliampères which is about as much as the patient will tolerate The current is allowed to pass for thirty to forty minutes and the patients often remark that the slight burning effect is most noticeable from the warts which have been painted with alkali which increases the conductivity of the skin. Dr Grace Griffiths, working in one of our clinics, obtained 50–60 per cent of cures of multiple warts affecting the hands and feet with this technique

Ionisation with smaller currents is useful for chronic sinuses and excessive granulations and sluggish ulcers. In the treatment of solitary warts a zinc needle on the positive electrode may be inserted directly into the base of the wart and a current passed, as in electrolysis. Many warts will disappear with this technique, but the treatment is somewhat longer and as painful as the application of the galvano-cautery or the diathermy point.

A suitable apparatus for electrolysis and ionisation consists of a rheostat with a resistance of about 1 000 ohms in series with a milliammeter An instrument based upon a model made by Bruin and designed to take ordinary radio batteries is illustrated in Fig 379C. However for electrolysis a battery of 2 or 4 volts may safely be used without any extra resistance or even a milliammeter and the patient can adjust the amount of current tolerated by the method described (p. 758).

Radiations

Radiations derived from the electro-magnetic spectrum are utilised in a variety of therapeutic methods. Radiations with the longest wave length of 3 to 12 metres are used in short wave diathermy and by such means the whole body or part of it may be appreciably raised in temperature The other electro-magnetic waves used in therapy have much shorter wavelengths which are recorded in Angstrom units (1 A U = 1 ten millionth of a millimetre).

Infra-red rays (7 700–4,000 000 A U) are no more than radiant heat from a source which is not visibly glowing A luminous source of heat has a superficial scorching effect upon the skin which does not permit of prolonged treatment and therefore has a much more superficial effect. By suitable resistances it is quite simple to arrange for an electrical element such as that in an ordinary bowl fire to reach a temperature so that only a

and if the patient is able to tolerate the higher milliamperage the time of application may be halved The resistance of a patient's skin between the needle and an indifferent electrode is about 2,500 ohms so that 2-4 volts are all that is necessary to supply such a current The equation, current in ampères equals the E M F in volts divided by the resistance covers the relationship between these three physical factors concerned in the technique and also that in ionisation (*i.e* I = E/R)

Electrolysis is used for permanent epilation of unwanted hair and for the destruction of small fleshy moles and vascular naevi of all varieties. In epilation the fine needle is inserted with the aid of a magnifying glass into the hair follicle as far as it will run with gentle pressure. During the insertion and during the removal the patient may take most of the hand from the bowl of saline or lessen the grip upon the manual electrode which may be used instead of the saline. By doing so the pain of the insertion and removal is much diminished and the patient is able to regulate the amount of current tolerable by tightening the grip on the electrode or inserting more of the hand into the bowl With a current of 1 or 2 milliampères minute bubbles of hydrogen are seen shortly to emerge from the orifice of the follicle and after twenty to thirty seconds according to the toughness of the hair and the amount of current tolerated it is usually possible with great ease to remove the hair and its sheath, which now looks gelatinous If a hair is resistant to its removal the papilla has probably escaped destruction Even in expert hands about 20 per cent of the hair papillae are not destroyed and require further treatment The reaction of the follicle should be noted, and if red spots are present on a subsequent visit the current or time of application should be reduced. Experience should determine the minimum amount of current necessary to procure permanent epilation because the slight puckering of the skin surface following the fibrotic reaction about the destroyed follicle will naturally be aggravated if larger currents are used, and an ugly peau d orange effect has been noted in many patients who have had electrolysis In fact electrolysis is no longer practised or recommended by us for extensive hirsuties, for which cosmetic methods of removal are advised but is reserved for hairy moles or for scanty hirsuties of the chin or breasts.

Electrolysis is an excellent method of removing fleshy moles. If hair is present the hairs are removed first by the method just described and then the needle is inserted horizontally through the base of the mole and the current is passed until the papule or nodule becomes tense and pearly white by distension with hydrogen A number of parallel punctures are made through the base of the lesion and repeated at right angles to the original insertions so that the inflammatory reaction and subsequent fibrosis will cause ischaemia and atrophy of the lesion.

Granuloma annulare has been successfully treated by electrolysis

In treating stellate naevi or telangiectases the needle is inserted into the fine vessels with the visual aid of a lens. If this is done successfully small bubbles of hydrogen may often be seen coursing along the vessels and after fifteen to thirty seconds application the vessel will disappear

Ionisation is not so popular a method of treatment as it was since it is now realised that penetration of ions into the skin with the ordinary currents tolerated by the patient is very limited However we have found

the method useful in the treatment of multiple warts on the extremities. It was found advantageous to paint the warts first with 10 per cent caustic soda solution and then to insert the hands or feet into vessels containing 1 per cent. of magnesium sulphate or 1 per cent. of sodium salicylate In the former case of ionisation with magnesium the positive electrode is placed in the solution, and in the case of sodium salicylate the negative The other limb may rest in normal saline connected to the opposite pole of the galvanic battery The resistance of the patient will of course vary with the area of skin conducting the current and with its properties. Soft, sweaty skins are good conductors, dry horny skins are bad conductors of current. If the hands are being treated between saline electrodes of this type the resistance of the body is about 6–8 000 ohms, so that 7–15 volts are required to give a current of 5–10 milliampères, which is about as much as the patient will tolerate. The current is allowed to pass for thirty to forty minutes and the patients often remark that the slight burning effect is most noticeable from the warts which have been painted with alkali, which increases the conductivity of the skin. Dr Grace Griffiths, working in one of our clinics obtained 50–60 per cent. of cures of multiple warts affecting the hands and feet with this technique

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dull glow is seen in a dark room Such an apparatus which may be simply constructed by placing two ordinary elements in series, is an efficient source of infra red irradiation and will be found of great value in the treatment of boils and carbuncles which often lose their excruciating pain when under the infra red rays The apparatus may be brought as close to the skin as is pleasantly tolerable Infra red is also valuable in the treatment of chronic chilblains and erythema induratum and it might with advantage be applied more frequently to the weeping lesions of dermatitis and eczema Often pruritus is relieved by infra red irradiation

Chromo-therapy (wavelengths red light 7 000 A U violet light 3 800 A.U) Some assert that exposure to light of various colours assists healing or relieves pain and irritation but such treatment is not seriously regarded as a therapeutic measure and the good effects claimed by these methods may be due to suggestion However it is known that light of longer wavelength is less injurious to the skin and in smallpox the facial eruption is favourably influenced by red light, which is also best tolerated by light sensitive subjects

Ultra violet rays These rays with wavelengths from 3 000 to 1 850 Angström units are emitted from carbon or tungsten arcs or from quartz burners usually containing mercury General irradiation is very useful in dermatology for improving general metabolism and immunity and is of the greatest help in lupus vulgaris (p 400) It is a useful measure in other infections such as impetigo in children furunculosis pustular acne and occasionally is very beneficial in urticaria, the various types of perniosis and some cases of psoriasis *As a rule a mild erythema dose should be given daily* if possible but it is often advantageous in the treatment *of acne to give a full erythema dose so that some degree of desquamation* occurs Red haired patients blondes and those with freckles are usually *unsuitable for irradiation and the effects of light* upon the skin are described on p 307 Obviously the light sensitive patients must not be *treated with ultra violet light e g* those with summer prurigo xeroderma *pigmentosa and lupus erythematosus A most important* contra indication to light therapy is pulmonary tuberculosis the presence of which should be carefully excluded before treatment is commenced Ultra violet light is used locally to stimulate healing or produce acute inflammatory reactions in chronic lesions The Kromayer lamp a water-cooled mercury vapour quartz burner is most commonly employed but the Finsen lamp and its recent modification by Lomholt are more useful for the destruction of tuberculous nodules When maximum penetration of the light is required it is essential to compress the skin and render it avascular quartz applicators are used for this purpose The Kromayer lamp is often used to stimulate healing in chronic ulcers or to produce an acute erythematous reaction on a patch of alopecia. The treatment time varies with the age of the burner and the sensitivity of the patient s skin *and as a rule the* Kromayer lamp is applied to the skin for periods from ten seconds to three minutes, whereas the Finsen and *Lomholt lamps are applied for one* hour These observations upon actinotherapy are quite inadequate unless supplemented by practical experience *(see p 403)*

Grenz rays or Bucky rays, having wavelengths about 2 Angström units, are the next rays in the electro-magnetic spectrum below the ultra violet to be utilised in therapy. These rays may be regarded as very soft X-rays. They are produced by a kilovoltage of 10 to 15 and are so easily absorbed that the tube requires a special window of lithium-borate glass to allow the rays to emerge. Even then they are rapidly absorbed by the air so that the apparatus is applied at distances of 5 to 15 cm. from the skin. Their ready absorption constitutes their special virtue as a therapeutic radiation because it is, in consequence, very difficult to damage the dermis. Atrophy or scarring are therefore very rare sequelæ and, in fact, only occur after very excessive dosage. The technique employed is very similar to that used in X-rays. The instrument (Fig. 380) should be periodically calibrated and a special ionisation chamber is required for this purpose. The

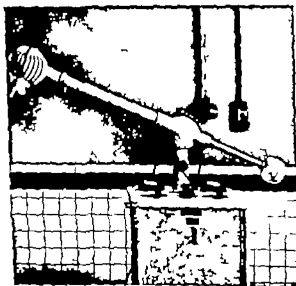


FIG. 380. Grenz-ray apparatus.

output should be estimated for various ranges of kilovoltage and milli amperage and then it is safe to estimate the doses according to the time of exposure. Doses of 200 to 500 r are useful for the relief of pruritus and sometimes succeed when X rays fail. Larger doses (1,200 r), producing an erythema and mild desquamation followed by pigmentation, are used to remove capillary nævi and are said to be effective in nævus flammeus which is, perhaps, the most refractory birth-mark to treatment. Psoriasis and lichen simplex often react favourably and some workers have used Grenz rays with success in the treatment of lupus vulgaris. In maximum doses of 1,500–3,000 r they may be successful with the very superficial types of rodent ulcer but for most purposes X-rays are as effective and have a much wider range of therapeutic usefulness (see p. 57).

X-rays. The X-ray tube is a device for hurling electrons at a metal target called the anti-cathode. The high voltage applied to the X-ray tube

dull glow is seen in a dark room. Such an apparatus which may be simply constructed by placing two ordinary elements in series, is an efficient source of infra red irradiation and will be found of great value in the treatment of boils and carbuncles which often lose their excruciating pain when under the infra red rays The apparatus may be brought as close to the skin as is pleasantly tolerable. Infra red is also valuable in the treatment of chronic chilblains and erythema induratum and it might with advantage be applied more frequently to the weeping lesions of dermatitis and eczema Often pruritus is relieved by infra red irradiation.

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detach their electrons. This accounts for secondary radiation which has to be considered when large areas of the body are being irradiated. Scattered rays are also a danger to the operator who may suffer harm from cumulative secondary irradiation although being scrupulously careful in avoiding exposure to the direct rays.

From these remarks it would appear that the biological effects of X-rays upon the human body are due to chemical changes produced by the removal of the linking electrons or to ionisation. Such chemical changes might well explain alteration or suspension of cellular metabolism, but it is more difficult to understand why pruritus may be relieved so dramatically. As previously explained (p. 314) after an erythema dose of X-rays there is a latent period of from eight to fourteen days in which no perceptible reaction of the skin can be discerned. With sub-erythema doses one would expect a longer latent period before an organic effect would develop and yet many patients obtain relief immediately or within a few hours after fractional X-ray doses. One suspects that suggestion plays its part in the effect of small doses of X-rays upon functional disorders of the skin and the therapy should be a detail of a comprehensive scheme.

For routine use an X ray apparatus with an output of 60–100 K.V. and a current of 3–5 milliamps is adequate for all ordinary purposes. With a modern X-ray tube there is an inherent filtration equivalent to 0·3 mm. of aluminium and no extra filter is therefore necessary or advisable unless a patient is found to pigment easily after treatment. Then an additional 0·5 mm. of aluminium may be introduced and the dose adjusted accordingly. When treating deeper lesions some extra filtration is desirable otherwise a disproportionate amount of irradiation is absorbed in the superficial layers of the skin where reaction is least required. It should be remembered that with any filtration it is impossible to prevent the first layers of the tissues receiving the rays from absorbing more than the deeper layers; that is why it is physically impossible to destroy hair follicles without more seriously damaging the epidermis overlying them.

The constants preferred for routine dermatological treatments are:— 90 K.V. filament current 3 milliampères, filtration 0·5 mm. aluminium, focal-skin distance 17½ cm. With these factors the erythema dose with one Metalix tube used at St. John's Hospital for Diseases of the Skin was 480 r measured in the centre of the field at a skin distance of 17½ cm. with back-scatter, the tube output per minute being 70 r. This output has been found to vary between different tubes although the physical constants remain the same. For example, the previous tube used at St. John's Hospital gave an output of 80 r *per minute. With a modern plant the* output for a particular tube does not vary appreciably if these constants are maintained, and it is only necessary to make occasional checks with the dosimeter. For routine work fractional doses may be based on exposure times excepting when an epilation dose is being given; in this case dosage is so critical that it is advisable to check the dose before each treatment is undertaken.

In the past it was customary to measure X ray dosage by means of the pastille of Sabouraud and Noiré, but undoubtedly the modern methods of measurement using iontoquantimeters are much more accurate, and doses are now expressed as "r" units, "r" being the international unit of

repels these negatively charged particles and gives them their velocity The higher the voltage the greater the speed of the particle and therefore the greater is the amount of energy converted into X rays at the moment of impact upon an atomic system in the anti-cathode Displacement of inner-orbital electrons gives rise to X rays the wavelengths depending upon the kinetic energy of the flying electrons Some cathode rays as these electron beams are called give up all their energy on impact and produce X rays of short wavelength while others are diverted from their paths and only lose part of their energy producing X rays of longer wavelength up to 1 A U Therefore it is inevitable that however constant the voltage the resulting X ray beam is heterogeneous In actual fact it is practically impossible to obtain a constant high voltage and so X rays of every conceivable wavelength are thus produced by both factors. Since the X rays diverge from a relatively small area on the anti-cathode it follows that the intensity varies inversely as the square of the distance It is therefore important accurately to fix a focal skin distance and if a larger area of the body is to be irradiated a correction for the dose received by the skin must be made according to this fact The intensity of X rays coming from an X ray tube varies directly with the current e g a tube working at 90 K V and 4 m.a has an output twice as great as one working at the same kilovoltage and 2 m.a On the other hand, the intensity varies with the square of the voltage applied to the tube, that is, a tube working at 100 K V and 2 m.a has an output four times that of a tube working at 50 K V and the same current It is found in practice that individual peculiarities of the tubes under varying currents and voltages show small departures from these theoretical estimations While an increase of current through the tube mainly affects the quantity of rays emitted, an increase of the voltage not only affects the quantities but also their quality The higher the voltage applied to the tube the harder are the X rays produced. Hardness, in this sense denotes shorter wavelengths which have greater penetrating power With the introduction of radium therapy when it was found that the gamma rays were harder than the hardest X rays yet produced radiotherapists strove to imitate the gamma rays by demanding higher and higher voltages Upper limits of between 500 and 1 000 K.V were envisaged but it appeared to be overlooked that the use of such hard X rays as are produced by voltages of this order is extremely wasteful since so small a proportion is absorbed. It is only from the rays absorbed by the atomic systems in the tissues that therapeutic effects are obtained So inevitably interest has returned to the softer rays and for ordinary routine dermatology we have little doubt that a kilovoltage not exceeding 90 is the upper limit of usefulness giving a minimum wavelength of 0·14 A U

The effects of X rays on the tissues are difficult to understand When X rays penetrate the tissues some pass on unaltered others by atomic collision cause a photo-electron to leave its orbit on the inner ring of an atom and this itself produces a characteristic radiation Or a peripheral electron may be detached which then carries away its unit negative charge and leaves the atom positively charged or ionised In this case the atom is most receptive of chemical combination Whenever electrons are detached from their orbits they themselves affect other atoms and may

in the solar system minute particles are shot from their orbits and under experimental conditions their luminous paths can be traced. The larger particles are the nuclei of helium atoms and are called alpha particles or *alpha rays* They have very short paths and being unable to penetrate the walls of the radium appliances used to-day they do not contribute to the therapeutic value of radium but are potent when derived from radon or from thorium X in solution and applied as a paint, wax or varnish.

The smaller particles called *beta rays* are electrons shot from the nucleus of the atom with velocities approaching that of light. These rays have no counterpart in therapeutics although they are analogous to the cathode rays which, however do not penetrate the glass of the X ray tube

The *gamma rays* are analogous to X rays and have the same velocity but differ in having shorter wavelengths and greater powers of penetration. They form with X-rays part of the spectrum which includes the electromagnetic waves of radio short wave diathermy infra red, visible and ultra violet light but whereas the production of these others can be regulated at will no method of affecting the quality or quantity of gamma rays emitted from radium is known. This fact makes radium an ideal source of irradiation, for the constancy of its output is only affected by its natural decay which at the rate of 0·04 per cent. per annum is negligible in therapy

With the discharge of alpha and beta particles radium becomes transformed into a gas, *radon or radium emanation* and this by the further loss of particles becomes in successive stages radium A, radium B radium C and eventually finishes its life of radioactivity and attains immortality as base lead. Since the beta and gamma rays used in treatment come from radium B and C it follows that radon can be used equally well instead of radium and the technical application of this fact will be dealt with later (p 767).

Although it is impossible to affect the emission of beta or gamma rays from radium, by interposing metal sheets the quality and quantity of radiation reaching the skin can be regulated. This is known as filtration or screening and for practical purposes the amount of radiation absorbed by a screen depends upon the thickness and density of the metal sheet. Screening affects the quality of radiation reaching the skin by removing the soft rays, that is the less penetrating rays. Since beta rays consist of minute projectiles (electrons) their penetrating power depends upon their velocities, whilst in the case of gamma rays there is a common velocity and soft rays are those having longer wavelengths By removing the soft rays filtration greatly reduces the intensity of tissue reaction which depends entirely upon the rays absorbed, and to compensate for this, exposures to screened radium must be prolonged. A further advantage of screening is that there is more equality between the reactions of the superficial and the deeper tissues so that screening is important for all except the very superficial lesions. Screens are made of brass, silver lead, gold or platinum and their usual purpose is to secure a relatively pure gamma radiation by absorbing the beta rays. For example 1·2 mm. of lead or 0 6 mm. of platinum absorb 90 per cent. of primary beta rays and although secondary beta rays are produced in the screen they are relatively inert. Some of the softer gamma rays are also removed by these screens, but the effect is neglible compared with that upon the beta rays. Conversely a

quantity In skin therapy it is important to correlate the dose in international units with the erythema dose and for this purpose constants are selected for voltage, filament current, filtration and focal skin distance To include back scatter the ionisation chamber should be placed on the skin or on a rubber bottle filled with water at skin temperature Varying exposures are then given and the erythema dose is taken to be that which produces a slight erythema in about eight days after irradiation, with slight pigmentation about a month later As the skin response of individuals varies considerably it is advisable to take the average reading from a number of the most sensitive individuals but the interpretation of the *erythema dose* from clinical observations is complicated by the appearance of an early erythema which not infrequently confuses the observer Experience has shown that a dose of 450 *r* with the constants above mentioned may be regarded as the erythema dose for therapeutic purposes, with a margin of safety E D is the abbreviation for " erythema dose.

X rays in small doses (*e g* ⅓ E.D 150 *r*) are most frequently employed to relieve irritation and such conditions as lichen simplex, eczema rosacea psoriasis erythema pernio and pruritus ani are often improved Slightly larger doses (*e g* ½ E.D., 225 *r*) are of value in chronic acne hyperidrosis, hidradenitis etc. Doses of 100–200 *r* appear to be beneficial in chronic inflammatory lesions *e g* in boils and carbuncles pain is relieved and resolution hastened and the healing of chronic ulcers is stimulated In these conditions weekly doses of 50 *r* may be given With fractional doses it is a safe rule not to let the sum exceed 450 *r* in a single course and not to repeat the course before an interval of *three months* Further indications for the use of X rays and the doses required have been made in the text (see also p 313)

The Pastille Dose of Sabouraud and Noiré (450–400 *r*) is used for temporary epilation in the treatment of ringworm of the scalp or sycosis barbæ Plantar warts often respond to doses of 1½ or 2 P D 700–900 *r* Larger doses 2 to 6 P.D are reserved for the treatment of malignant disease Doses exceeding 400 *r* should be carefully restricted to the actual lesion by screens of lead at least 1 mm thick or by rubber containing lead

The Radiations from Radium

Radium is a therapeutic agent of great value and as it is important that the practitioner should be familiar with its effects it is necessary to consider certain properties of this remarkable element because upon these properties depend its power of influencing atoms and cells without itself taking any part in the reaction The physics of radium is a complicated and fascinating subject but fortunately the essentials requisite for an understanding of the principles of superficial therapy are not difficult. Nevertheless a popular conception is bound to be inaccurate in some of its detail and the use of such terms as particles rays and waves does not imply that the ultimate nature of these things is understood

Perhaps it is most helpful to regard the radium atom as a miniature solar system of incredibly small particles observing orderly movements in orbits around a central nucleus corresponding to the sun The complexity of the atom apparently accounts for its instability and like shooting stars

in the solar system, minute particles are shot from their orbits and under experimental conditions their luminous paths can be traced. The larger particles are the nuclei of helium atoms and are called alpha particles or *alpha rays*. They have very short paths and being unable to penetrate the walls of the radium appliances used to-day they do not contribute to the therapeutic value of radium but are potent when derived from radon or from thorium X in solution and applied as a paint, wax or varnish.

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The *gamma rays* are analogous to X-rays and have the same velocity but differ in having shorter wavelengths and greater powers of penetration. They form with X-rays part of the spectrum which includes the electro-magnetic waves of radio, short wave diathermy, infra-red, visible and ultra-violet light, but whereas the production of these others can be regulated at will, no method of affecting the quality or quantity of gamma rays emitted from radium is known. This fact makes radium an ideal source of irradiation, for the constancy of its output is only affected by its natural decay, which at the rate of 0·04 per cent. per annum is neglible in therapy.

With the discharge of alpha and beta particles radium becomes transformed into a gas, *radon* or *radium emanation* and this by the further loss of particles becomes in successive stages radium A, radium B, radium C and eventually finishes its life of radioactivity and attains immortality as base lead. Since the beta and gamma rays used in treatment come from radium B and C, it follows that radon can be used equally well instead of radium and the technical application of this fact will be dealt with later (p. 767).

Although it is impossible to affect the emission of beta or gamma rays from radium, by interposing metal sheets, the quality and quantity of radiation reaching the skin can be regulated. This is known as filtration or screening and for practical purposes the amount of radiation absorbed by a screen depends upon the thickness and density of the metal sheet. Screening affects the quality of radiation reaching the skin by removing the soft rays, that is the less penetrating rays. Since beta rays consist of minute projectiles (electrons) their penetrating power depends upon their velocities, whilst in the case of gamma rays there is a common velocity and soft rays are those having longer wavelengths. By removing the soft rays filtration greatly reduces the intensity of tissue reaction which depends entirely upon the rays absorbed and to compensate for this, exposures to screened radium must be prolonged. A further advantage of screening is that there is more equality between the reactions of the superficial and the deeper tissues so that screening is important for all except the very superficial lesions. Screens are made of brass, silver, lead, gold or platinum and their usual purpose is to secure a relatively pure gamma radiation by absorbing the beta rays. For example, 1·2 mm. of lead or 0·6 mm. of platinum absorb 99 per cent. of primary beta rays and although secondary beta rays are produced in the screen they are relatively inert. Some of the softer gamma rays are also removed by these screens but the effect is neglible compared with that upon the beta rays. Conversely a

pure beta radiation is unobtainable, but since beta rays being more readily absorbed by the tissues are much more potent they require a shorter treatment period which makes the accompanying gamma radiation insignificant. The importance of securing pure gamma radiation has been stressed so often that it might be thought that beta radiation is something inferior On the contrary it is most probable that gamma rays owe their activity to the beta rays they produce in the tissues so that in actual fact all radiotherapy is beta ray therapy The real objection to the presence of primary beta rays when using gamma rays depends upon the intense superficial reaction the former produce Before considering the action of these radiations upon the skin it should be pointed out that the direct effect is on individual atoms and while many details of the atomic changes are known the reasons for the cellular reactions are still obscure.

When a gamma ray is absorbed by an atomic system its energy causes an electron to leave its orbit and fly off as a secondary beta ray or the increased kinetic energy of the electron produces a secondary gamma ray of longer or of the same wavelength and this in its turn may be absorbed and produce similar effects. Beta rays either primary or secondary also act by dislodging an electron leaving the parent atom positively charged or ionised Increased chemical affinity is associated with ionisation and it is believed that in consequence the chemistry and metabolism of cells are modified resulting in degeneration, disturbances of nuclear division or definite necrosis Obviously cells which are in active phases of reproduction or function are most likely to be affected and as a general rule this is so but the question of cell radiosensitivity is beset with difficulties, for it has been shown that this property is not constant and may be influenced by physical chemical and biological factors. How these variables determine cellular responses to irradiation is not clear and therefore the reaction of a tissue being the sum of cellular reactions is even more difficult to understand Although cell radio-sensitivity seems to be all important in the reaction of malignant lesions such as rodent ulcers changes occur in the stroma and also in the body fluids. Following irradiation early damage to the small vessels has been noted and by interfering with the blood supply this may largely account for the degenerative and necrotic processes seen in malignant tissues and ascribed to direct action Indeed radium is at times used especially for its effect upon blood vessels and as later described is useful in the treatment of vascular naevi The presence of a healthy stroma is evidently necessary and it is believed that it is the absence of it in previously treated cases of malignant disease which accounts for the less favourable response to further irradiation.

Workers with radium suffer from a dystrophy of the nails closely resembling that produced by X rays We have also seen small warty intractable excrescences on the fingers The use of comparatively large quantities of radium induces a curious lethargy which is sometimes associated with aplastic anaemia. In view of the fatalities which have occurred it is advisable that doctors nurses, and chemists engaged in radium therapy should be subjected to periodic blood counts and not work for long periods in the presence of even moderate quantities of this substance (see p. 318)

A further useful check is for the workers exposed to radium and X rays to carry a wrapped dental X ray film on their persons for a whole week.

The amount of fogging is a measure of radiation received and a competent physical laboratory can estimate the hazard.

Radium Appliances used in Dermatology

(1) The radium plaque or plate. This consists of a shallow metal tray containing an evenly spread layer of a radium salt in a suitable matrix which is hermetically sealed in by a face of monel metal 0·1 millimetre thick. The plaques are usually round or square and if full strength contain 5 milligrammes of radium element per square centimetre. Most of the soft beta rays are screened off by the metal face, but the harder rays are transmitted and plaques are usually employed for beta ray therapy. The even surface distribution of the radium makes the plaque ideal for the treatment of small superficial lesions and as the time of application of beta rays is one to three hours, treatment can be given to out-patients. The beta rays emitted by such a plate have an intense surface effect, and afford a valuable method of treating capillary naevi, warts and superficial rodent ulcers. *The plate, usually protected by thin rubber* is simply strapped in contact with the lesion, the surrounding skin being *protected by a lead* screen 1 mm. in thickness. Deeper lesions such as cavernous naevi, are better treated by the screened plate, 1 mm. of lead, 0·5 mm. of platinum, or its equivalent, being interposed between the plate and its rubber cover. In this case the beta rays are absorbed by the screen, and the more penetrating gamma rays are employed, the treatment period being extended to twelve to twenty-four hours. When gamma rays are used in treatment, the dose is usually expressed as milligramme hours per square centimetre of surface treated, and a dose of 60 mgm. hours is suitable for the treatment of a cavernous naevus and twice this dose for a malignant lesion.

(2) **Radium needles** have platinum walls at least 0·5 mm. thick, so that they may be regarded as sources of pure gamma rays. The needles may be embedded in the skin or applied to the surface in special applicators or on wax moulds. If applied in contact with the skin, the dose is estimated in milligramme-hours, the period of application depending upon the amount of radium applied to each square centimetre.

(3) *Radon seeds* consist of minute glass tubes containing radon encased in platinum or gold tubes with walls 0·8 millimetre thick. Radon is a gas, the first degradation product of radium, and the further physical changes in radon are those which give radium its therapeutic properties, so that for practical purposes radon equals radium, with the sole disadvantage that the former has a limited life, being reduced to one-half in just under four days and to a negligible quantity *in* a month. In a mature radium appliance the radon is produced as rapidly as it is destroyed, so that the potency of a radium needle or plate remains constant. It has been found that the superficial lesions of dermatology can be adequately treated by radon in spite of its diminishing potency, the treatment period being increased by calculation to compensate for it. The following table shows how the dosage of radon can be compared with that of radium —

One millicurie of radon left in position for	1	2	3	4	5	6	7	8	9	10	30	days
Is equivalent to	22	40	56	68	79	88	96	102	107	111	133	mgm.hours of radium.

One millicurie is the amount of radon which is in equilibrium with 1 milligramme of radium. In practice the content of radon seeds varies considerably but dosage may be estimated by simple proportion from the above table. Although no therapeutic difference exists between radon and radium, radon seeds have the advantage of being smaller than radium needles, much less expensive and as they have no permanent value may be used for out-patient treatment. Further, the dose in each seed may be varied and, being a gas, the radon is uniformly distributed throughout the length of the tube. Being so small, radon seeds can be implanted in the skin by first making a track with a double-edged tenotome, or the seed, threaded with silk, may be drawn into position in the track of a large surgical needle, the silk being fixed to the skin by a collodion seal. Rodent ulcers, squamous-celled epithelioma and deep cavernous nævi have been treated successfully by implanted radon seeds.

Radon may be incorporated in wax, and thus applied as a form of mild radiation therapy to simple lesions such as the lichens and psoriasis. The therapeutic activity of this wax is mainly due to beta rays, but no doubt some alpha particles reach the skin. Lomholt has demonstrated a convenient method of preparing radon wax, which he considers to be a valuable therapeutic agent.

At some time or other almost every chronic disease of the skin has been treated with radium, but in dermatological practice its use is *limited by experience* to relatively few conditions. These will be discussed briefly in an order approximating to their favourable response to radium therapy.

Rodent ulcers almost invariably react extremely well to either beta or gamma radiation and between these two there is little to choose having regard to end results, which should be satisfactory in about 95 per cent of early cases. The cosmetic result is usually very good too. Large ulcers with appreciable depth respond better to gamma rays and treatment with radon seeds or radium needles is advised. When bone or cartilage is involved radiation may be ineffective and resort has to be made to some method of coagulation.

Tar warts, the senile and actinic keratoses, respond equally well and when they have benign characters smaller doses of radiation are effective.

Squamous celled epitheliomata are generally regarded as less radio-sensitive than rodent ulcers and in consequence they are subjected to larger doses of radiation. The small lesions treated by dermatologists seem to clear up as readily as the basal-celled variety.

Warts can often be made to disappear with beta or gamma radiation and this favourable reaction may be due to the necrosis of the cells containing the virus or to the inflammatory changes which inevitably occur. Since the virus is found in the deeper layers of the epidermis the whole of this and the dermis is involved in the necrosis and scars must result when heavy doses are given. Vigorous treatment should therefore not

be given to warts over small joints or near nails for permanent deformities of the nail plate not infrequently follow irradiation of peri-ungual warts. On the whole it is better to use small doses of rays just sufficient to produce a mild inflammatory reaction Many warts will then clear up without leaving a visible scar and the others are preferably treated by curettage or cauterisation.

Cavernous naevi usually disappear spontaneously and only require treatment when conspicuous or if they appear to be enlarging rapidly Their disappearance may be hastened by cautious gamma ray therapy A convenient method is to apply radium needles over crêpe rubber for several hours a day until a total dose, not exceeding 60 milligramme hours per square centimetre of surface is given. Excellent cosmetic results have also been obtained by inserting screened radon seeds into the vascular tumour By this method the skin is relatively unaffected. In contrast is the treatment with CO_2 snow which gives an intense surface effect and leaves the deep lesion unaltered a bad method.

The pale *capillary naevi*, on the other hand, respond well to freezing or to thorium X and a good cosmetic result is more easily obtained than with beta radiation.

Pigmented naevi are never popular in a radiotherapeutic clinic because it is known that very occasionally a melanotic carcinoma of high malignancy arises after interference. However the brown macular naevi, with or without hair can be much improved by beta irradiation, and since no other treatment apart from plastic surgery is availing lesions on the face are not infrequently dealt with by this method. Thorium X is of some value here

Port wine marks are notoriously unsatisfactory in their response to any treatment and we have found them impossible to influence with gamma rays, and beta rays in effective doses result in an atrophic scar and telangiectases. Painting with thorium X, as described below produces some improvement and doses of Grenz rays *1 400 r.*, repeated at intervals of three months will much reduce the colour Slight blistering doses with a Kromayer lamp have also been of service.

Keloids vary greatly in their response to irradiation and while some lesions clear up almost without a mark to indicate their site many are but little affected or become paler and flatter Beta and gamma rays can be used and screening should be increased with the thickness of the lesion.

Corns may respond to lightly filtered radium or X-rays 900 *r.*, but this treatment should be reserved for chronic relapsing cases. Obviously the rational treatment is to remove the callosity and the source of pressure, so chiropody should precede radium therapy Other forms of localised keratosis may also be improved by cautious radium therapy

The tumours of *mycosis fungoides* are quite radio-sensitive and radium is worth while trying if X rays fail or are not available. In fact, the local response is often so good that this disease would have been placed higher in the list if it had not been so rare

Other skin diseases are rarely treated by radium in dermatological clinics in this country This is not because mild radium therapy is useless but that facilities for minor treatments under expert supervision are not available.

Thorium X is another radioactive substance which has proved useful in skin therapy Its radioactivity is due almost entirely to alpha particles which have already been described and it was indicated that these particles have very limited power of penetration Consequently unless dosage is very excessive the dermis is not directly affected although the superficial vessels of the papillary layer may be damaged Thorium X has a half life period of 3·64 days and emits only alpha rays Its decay products have much shorter half life values but some of them emit beta and gamma rays, the presence of which may be readily detected However the alpha particles carry much more energy and must account for most of the thera peutic effects Some of our cases over several years have received up to thirty monthly paintings with thorium X without showing any of the atrophy and telangiectasia which are almost inevitable with a reaction to beta rays. In view of the presence of beta and gamma rays it is probably unwise to continue an indefinite number of paintings with thorium X solutions until a much longer period of observation has established the safety of the procedure It is recommended that an alcoholic solution of thorium X containing 2 000 electrostatic units per cubic centimetre be employed and the date it is to be used must be stated in the order because thorium X loses half its activity in just under four days. It is most useful for capillary hæmangiomata of the paler types and has been advocated for port wine marks but although some paling follows its use we have been disappointed with this therapy The skin is first cleaned with ether and then the lesion is accurately painted with the alcoholic solution To secure a more vigorous reaction several coats of the solution may be applied, and the evaporation of the spirit assisted by ventilation or blowing Then a thin layer of collodion is used to seal in the radioactive solution and within twenty four hours or in a day or two an erythematous reaction occurs with subsequent scaling and pigmentation The treatment should be repeated every month until a satisfactory result has been achieved If no remarkable progress is seen after twelve monthly paintings the method should be abandoned, otherwise it may be continued for eighteen or twenty four treatments (see p 56)

Thorium X is also of value in the treatment of the less obvious pig mented macular nævi and it has been advocated for the treatment of psoriasis lichen simplex and localised pruritus including mycosis fungoides We believe it has no advantages over the X rays for these latter conditions It has also been used in the local treatment of alopecia areata, flat warts and tinea unguium

We are indebted to John Reid B.Sc. Ph.D Head of the Biophysics Section of the Research Department of Mount Vernon Hospital North-wood, Middlesex, for the following summary of his observations on the relative energies of alpha rays beta rays and gamma rays absorbed during thorium X treatment of the skin

(a) by the whole body

(b) by the skin layer under treatment

Summary (a) The total energy absorbed by the whole body when a skin application of thorium X is given in the form of alpha radiation is some twenty times greater than that in the form of beta or gamma radiation

(b) The energy absorbed in the first 100 μ thickness of skin from the alpha

radiation is of the order of 1 000 times as great as that absorbed from the beta radiation, while the gamma ray energy absorbed per cubic centimetre in this thickness is quite negligible

The alpha radiation is likely to be several times as effective in producing a skin reaction as is an equal amount of absorbed beta ray energy

Thorium X preparations in varnish, ointment or alcohol are obtainable from Derby and Co., Ltd., 62 Cheapside London, E.C 2

INDEX

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